MARINE REVIEW.

VOL. XVII. CLEVELAND, O., JANUARY 20, 1898. No. 3.

Annual Report of Ship Building.

INFORMATION OF VESSELS UNDER CONTRACT AND BUILDING IN THE SHIP YARDS OF THE UNITED STATES, DEC. 31, 1897.

$11,500,000 IS THE APPROXIMATE VALUE OF PRIVATE SHIP BUILDING, THE NEW NAVAL AND GOVERNMENT WORK COMMENCED DURING 1897 AMOUNTING TO ONLY $1,083,500—THE PRIVATE BUILDING IS DIVIDED AS FOLLOWS: GREAT LAKES, $4,385,600; ATLANTIC COAST, $4,637,750; PACIFIC COAST, $2,154,500; WESTERN RIVERS, $337,000—THIRTY-THREE VESSELS ARE BUILDING IN THE UNITED STATES, THE VALUATION OF WHICH RANGES FROM $100,000 TO $500,000, EIGHTEEN ON THE LAKES, TEN ON THE ATLANTIC, AND FIVE ON THE PACIFIC COAST—AN INCREASE OVER LAST YEAR OF ONE-HALF IS SHOWN IN COAST AND RIVER YARDS, AND ONE-THIRD IN LAKE YARDS.

The Marine Review's fourth annual report of ship building in the United States shows a very satisfactory condition as compared with last year, especially in regard to private work. The new naval and government work contracted for amounts to $1,083,500—very meager as compared with previous years. As shown in a table on this page, the value of the tonnage building in lake ship yards is a third more than last year, there being only one year in the last five that has exceeded this. The character of the tonnage being built is shown by the fact that there are only thirty-three vessels building in the country having a valuation over $100,000, only two running as high as $500,000. Of these thirty-three, eighteen are building on the great lakes, and nine of them are valued at more than $200,000, one passenger steamer costing $375,000. Seven vessels in lake yards range from 400 to 476 feet long, and eight are over 300 feet. In all other parts of the United States there are only four vessels building that are 300 feet and over. Of the other fifteen vessels having a value over $100,000, ten are building on the Atlantic and five on the Pacific coast. It is worthy of note that the first American tramp steamer is soon to be built at the Bath Iron Works for Miller, Bull & Knowlton. The price of material now enables American yards to compete with English yards, notwithstanding the higher cost of labor. Three of the vessels costing over $100,000 are steam yachts for American millionaires, who are patriotic enough to want better yachts for less money than can be had on the other side. One is a steel sailing ship, five passenger and freight steamers, two ferry steamers, and three passenger steamers, one being side-wheel. Of the eighteen larger vessels building on the lakes, six are steel freight steamers, equipped with quadruple expansion engines, the largest built in this country. Five are steel towing schooners or barges, four are steel passenger steamers, two are wooden freight steamers, two wooden tow barges, and two steel revenue cutters.

These figures are based on official reports from all the principal ship yards. We mention in notes other ship building, but do not include it in the figures. For instance, it is generally known or supposed that Roach's ship yard, Chester, Pa., has a contract for one or two 5,000-ton steamers for Pacific-Yukon service, but they do not include it in their report. The Klondike gold finds are responsible for $1,500,000 worth of ship building in the country. This represents bona fide contracts and actual building. If general reports proved true, as to the number of craft building for the Alaskan trade, the question of rebuilding the American merchant marine would be solved.

VESSELS UNDER CONTRACT IN LAKE SHIP YARDS EACH YEAR FOR TWELVE YEARS PAST.

DECEMBER 31.	NUMBER OF VESSELS.	CAPACITY, GROSS TONS.	VALUATION.
1886	31	65,750	$4,074,000
1887	60	108,525	8,325,000
1888	59	100,950	7,124,000
1889	56	124,750	7,866,000
1890	38	77,950	5,337,000
1891	45	76,000	4,896,000
1892	49	68,470	6,909,500
1893	28	26,400	2,538,500
1894	29	33,150	2,932,500
1895	65	136,600	8,549,000
1896	31	69,255	2,898,000
1897	40	77,100	4,385,600

VESSELS UNDER CONTRACT IN LAKE SHIP YARDS, DEC. 31, 1897.

BUILDERS.	TYPE OF VESSEL.	DIMENSIONS. OVER ALL	KEEL	BE'M	DPTH	CAPACITY gross tons 17 FEET DRAFT.	APPROXIMATE VALUE.	ENGINES. DIMENSIONS OF CYLINDERS AND STROKE.	BOILERS—NUMBER, DIMENSIONS AND PRESSURE.	BUILDING FOR
American Steel Barge Co., West Supe ior.	Steel frt. stmr.	.....	414	50	27	5,900	$230,000	Quadruple engines.	2, B & W watertube, 250	American Steel Barge Co.
American Steel Barge Co., West Superior.	Steel tow barge.	390	376	46	26	5,600	140,000	.....	.....	Minnesota Steamship Co.
Anderson, Alex., Marine City, Mich.	Wooden steamer.	142	130	30	9	.....	28,000	16, 32 x 36.	One, 8½ x 13.	Pine Lumber Co., Fremont, O.
Bertram Engine Works Co. Toronto,, Ont.	Steel pass. stmr.	277	269	36*	14	.....	250,000	Inclined Triple.	Scotch boilers.	Richelieu & Ontario Navigation Co.
Bertram Engine Works Co., Toronto, Ont.	Steel pass. stmr.	277	269	36*	14	.....	250,000	Inclined Triple.	Scotch boilers.	Richelieu & Ontario Navigation Co.
Bertram Engine Works Co., Toronto, Ont.	Stern wheel stmr.	.....	160	35	5	.....	50,000	.....	.....	Canadian Pac. Ry. Co.
Bertram Engine Works Co., Toronto. Ont.	Stern wheel stmr.	.....	160	35	5	.....	50,000	.....	.....	Canadian Pac. Ry. Co.
Bucyrus Co., So. Milwaukee, Wis.	Dredge.	.....	135	44	13	.....	55,000	Double 18 x 24 H. P.	.....	Hingston & Woods, Buffalo, N. Y.
Bucyrus Co., So. Milwaukee, Wis.	Dredge.	.....	98	34	7	.....	20,000	Double 10 x 14 H. P.	.....	Hingston & Woods, Buffalo, N. Y.
Burger & Burger, Manitowoc, Wis.	Wooden tug.	88	80	17	8	.....	8,000	Old engine.	Old boiler.	Endress Bros., Whitefish Point, Mich.
Calvin Co., Ltd., Garden Island, Ont.	Wooden steamer.	.....	200	37	15	.....	75,000	18, 30, 48 x 30.	One boiler, 160 pounds	Builders.
Chicago Ship Building Co., Chicago.	Steel frt. stmr.	420	400	48	28	5,100	210,000	21, 29, 42, 64 x 42.	Two, 14-8 x 11-6, 200.	C. W. Elphicke, Chicago.
Chicago Ship Building Co., Chicago.	Steel tow barge.	388	376	48	26	5,750	140,000	.....	.....	James Corrigan, Cleveland.
Cleveland Ship Building Co., Cleveland.	Steel frt. stmr.	426	406	50	28	5,750	220,000	Quadruple engines.	2, B & W watertube, 250	Cleveland-Cliffs Iron Co., Cleveland.
Cleveland Ship Building Co., Cleveland.	Steel frt. stmr.	450	430	50	28	6,000	235,000	Quadruple engines.	2, B & W watertube, 250	A. B. Wolvin, Duluth.
Craig Ship Building Co., Toledo, O.	Steel tug.	.....	70	15	8	.....	12,000	12, 20 x 16.	Taylor water tube.	U. S. Engineer, Buffalo, N. Y.
Davidson, James, West Bay City.	Wooden frt. stmr.	315	300	44	26	3,150	135,000	16, 28, 42 x 36.	Two Scotch, 12' 3"x12'.	Builders' account.
Davidson, James, West Bay City.	Wooden frt stmr.	315	300	44	26	3,150	135,000	16, 28, 42 x 36.	Two Scotch, 12' 3"x12'.	Builders' account.
Davidson, James West Bay City.	Wooden tow barge	312	300	45½	26	3,500	80,000	built by S. F. Hodge & Co.	built by Wickes Bros.	Builders' account.
Davidson, James, West Bay City.	Wooden tow barge	312	300	45½	26	3,500	80,000			Builders' account.
Detroit Dry Dock Co., Detroit.	Paddle pass. stmr.	324	314	44†	18	.....	375,000	Beam, 80 in. l. p. x 12 ft.	Six, 12½ x 12½, 135	Cleveland & Buffalo Trans. Co.
Detroit Dry Dock Co., Detroit.	Steel pass. stmr.	.....	160	.....	.....	.....	75,000	15, 24, 38 x 24.	Two Scotch boilers.	Dunbar & McMillan, Michigan City.
Detroit Dry Dock Co., Detroit.	Steel frt. stmr.	400	.....	45½	28	5,000	225,000	Quadruple engines.	Three Scotch boilers.	Western Transit Co., Buffalo, N. Y.
Devney, J. P., Ashtabula, O.	Wooden tug.	80	.....	17½	8½	.....	20,000	.....	.....	Ashtabula Pass. & Fishing Co.
Globe Iron Works Co., Cleveland.	Steel rev. cutter.	205	188	32	17	.....	193,800	25, 37½, 56¼ x 30.	Four, 11-8 x 10, 160.	U. S. Revenue Cutter Service.
Globe Iron Works Co., Cleveland.	Steel rev. cutter.	205	188	32	17	.....	193,800	25, 37½, 56¼ x 30.	Four, 11-8 x 10, 160.	U. S. Revenue Cutter Service.
Globe Iron Works Co., Cleveland.	Steel tow barge	388	376	44	26	5,400	135,000	.....	.....	Wilson Transit Co.
Heath, E. W., Benton Harbor, Mich.	Wooden tug.	79	69	19	10½	.....	14,000	14, 30 x 20 F & A.	1 Scotch, 8 x 12.	Lydon & Drews Co.
Hill, Wallace W., Fish Creek, Wis.	Wooden stmr.	133	120	25	8	.....	25,000	14 x 16 H. P.	.....	Capt. E. B. Graham, Fish Creek, Wis.
Hill, Wallace W., Fish Creek, Wis.	Wooden tug.	75	65	16	7	.....	4,000	14 x 14 H. P.	.....	Builders' account.
Jenks Ship B'ldg Co., Port Huron, Mich.	Wooden tug.	.....	80	20	12	.....	25,000	14, 22½, 36 x 28.	One boiler, 200 pounds	For sale.
Milwaukee Tug Boat Line, Milwaukee, Wis.	Wooden tug.	.....	93	21	12	.....	15,000	14, 22½, 36 x 30.	One Scotch, 12 x 10 ft.	Milwaukee Tug Boat Line.
Polson Iron Works, Toronto, Ont.	Stern wheel str.	.....	140	33	.....	.....	50,000	.....	.....	Canadian Pacific Ry.
Racine Boat Mf'g Co., Racine, Wis.	Steel stm. yacht.	.....	75	12	4	.....	15,000	6⅝, 10¼, 16¾ x 9⅝.	Racine water tube.	Otto Young, Chicago, Ill.
Racine Boat Mf'g Co., Racine, Wis.	Steel stm. yacht.	.....	75	12½	4	.....	12,000	6⅝, 10¼, 16¾ x 9⅝.	Racine water tube.	M. A. Ryerson, Chicago, Ill.
Simpson, Melancthon, Toronto, Ont.	Wooden pass. str.	.....	105	22	7	.....	10,000	Compound.	.....	Brockville (Ont.) Navigation Co.
Union Dry Dock Co., Buffalo, N. Y.	Steel tug.	.....	90	23	12	.....	30,000	16, 25, 40 x 27.	Two Roberts boilers	Maytham Bros., Buffalo, N. Y.
Wheeler F. W. & Co., West Bay City.	Steel frt. stmr.	476	456	50	29	6,100	255,000	26½, 37, 54½, 80 x 42.	Four, 13-4 x 11-6, 200.	Bessemer Steamship Co., Cleveland.
Wheeler F. W. & Co., West Bay City.	Steel tow barge.	450	436	50	28½	6,600	155,000	.....	built by	Bessemer Steamship Co., Cleveland.
Wheeler F. W. & Co., West Bay City.	Steel tow barge.	450	436	50	28½	6,600	155,000	.....	Wickes Bros.	Bessemer Steamship Co., Cleveland.

*Over guards, 62 feet.
†Over guards, 78 feet.

Supplement to the Marine Review, Cleveland, O., January 20, 1897, Vol. 17, No. 3.

CAPT. JAMES S. DUNHAM, CHICAGO.

PRESIDENT OF THE LAKE CARRIERS' ASSOCIATION.

Lake Superior Iron Ore Shipments (Gross Tons) for 1897 and the Past Forty-two Years.

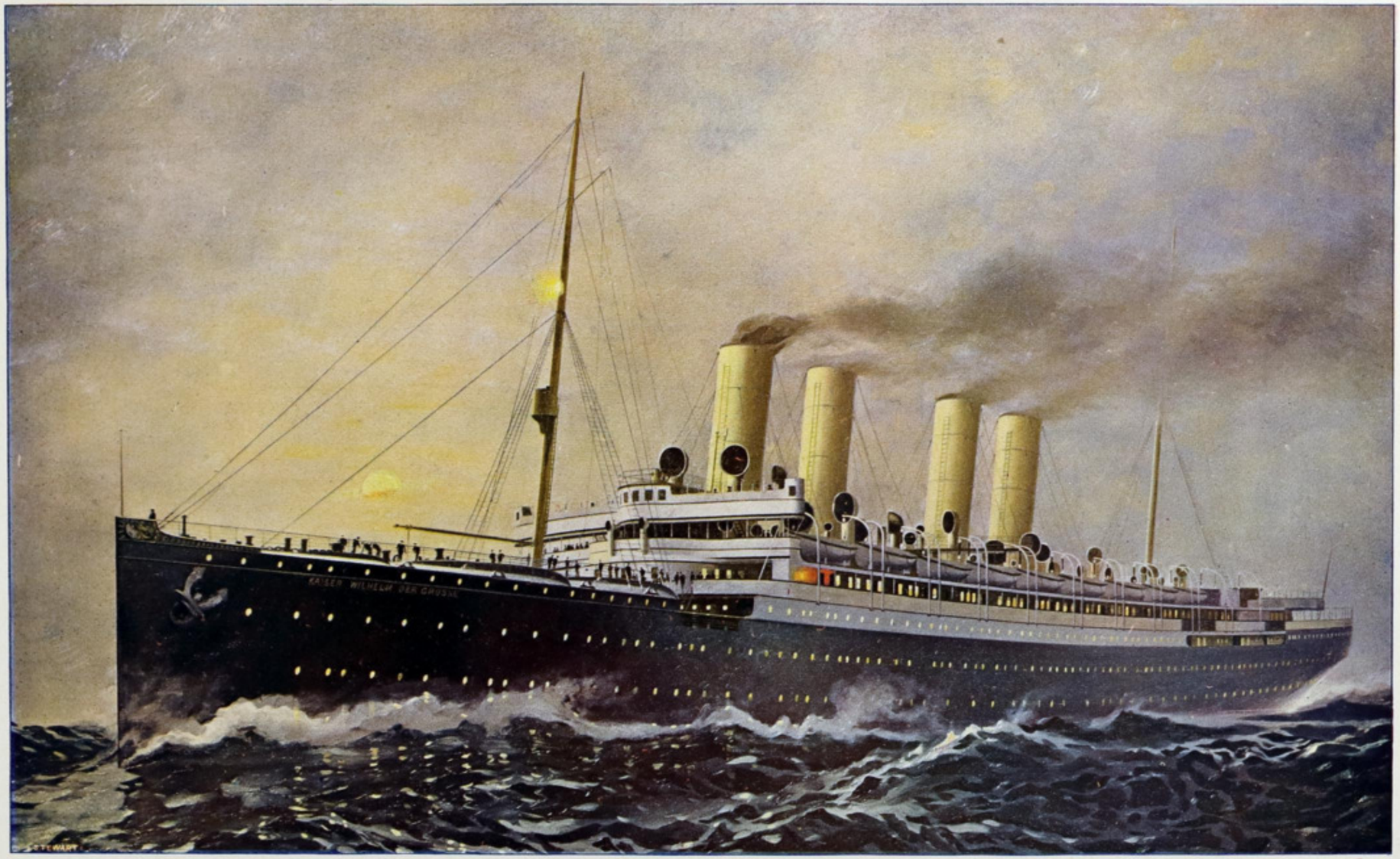
January 20, 1898. Vol. XVII., No. 3.

Supplement to THE MARINE REVIEW, Cleveland, Ohio.

NAME OF MINE.	Prior to 1881.	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	TOTALS.
Marquette Range.																			
American (Sterl'g)	797	4,702	8,006	3,618	2,916			1,483	13,699	20,032	21,000	21,604	15,076						112,933
Ames														1,103	5,195				6,298
Barnum (B)	460,428	27,883	41,778	62,732	69,408	47,458	52,975	16,123	10,211	12,835									801,851
Bay State	14,187	583	1,236	621															16,637
Bessie												847							847
Beaufort			5,532	18,976	18,360	17,166	17,354	12,829											90,217
Blue														13,809	32,171	44,140		2,519	92,639
Boston	6,478	14,824	18,245	20,190	2,218												587		62,542
Buffalo (A)							10,860	24,686	30,801	50,919	100,464								217,730
Braastad { Mitch'l	54,567	21,146	33,396				7,017	16,419	4,091										136,636
Braastad { Wint'p.	212,670	43,639	23,005	50,143	73,144	53,913	58,743	74,067	86,789	155,341									831,445
Cambria	36,458	19,246	64,545	47,508	59,742	50,796	58,784	41,130	57,861	72,780	80,359	34,662	41,549	30,445	47,218	41,656	95,086	110,648	990,473
Champion	830,480	145,427	159,009	104,960	210,180	173,915	137,593	146,330	174,680	215,098	223,442	133,413	109,979	61,648	42,788	100,398	113,375	141,728	3,224,443
Cheshire (Swanzey)	79,730	15,011	31,498	13,730	3,557		8,328	2,842				7,301	29,403	19,096		6,593			217,089
Chicago	3,364	5,531		117															9,012
Clev'd-Cliffs I. Co.	2,226,510	198,569	206,120	218,219	225,674	218,757	203,664	207,441	184,316	274,048	331,713	221,788	310,907	218,105	143,706	221,153	513,119	718,408	6,842,217
Columbia (Klom'n)	70,875	11,158	12,066	714															94,813
Curry										16,671									16,671
Detroit			5,402	12,314	3,809	19,125	39,400	26,099	18,500	10,112	6,080								140,841
Dexter				4,878	16,202	750			1,821	3,895	9,136	5,448	13,000	7,833	21,740	13,752	18,903	1,154	118,512
Dey					2,709														2,709
East Champion	60,856	3,408	4,002	5,639						2,097									76,002
East New York									13,694	29,739	36,431	50,293	35,175	911					166,243
Edison										893									893
Erie			2,731	5,405															8,136
Etna				1,091															1,091
Fitch											16,550	15,093				174			31,817
Foster (B)	105,938	3,011	11,648	10,029	9,675	9,643					21,949								171,893
Gibson						1,515	12,142	2,700											16,357
Goodrich	29,511	10,245	9,998																49,754
G'd Rapids (Davis)								1,200	11,611	20,058	26,426	9,362	22,823	352	12,073	6,764	67		110,736
Hartford										566			5,678	6,513			1,532		14,289
Hortense (N. Ch'p'n)								886	5,685	7,757	16,246								30,574
Humbolt	469,194	26,302	43,463	31,866	23,763	11,766	20,207	19,873	11,655	15,866	23,259	19,879	4,571				2,297		723,961
Iron Cliffs (K)								87,346	78,520	134,616	188,776	278,270	289,395	130,812	253,760	259,042			1,700,537
Imperial											38,460	18,552	7,194						64,206
Iron Mountain								393											393
Jackson	2,076,223	118,939	96,830	71,278	83,251	68,657	89,370	109,906	101,909	128,891	124,682	92,979	92,567	51,009	32,298	42,186	80,710	79,102	3,540,787
Lake Superior	2,434,221	262,235	296,509	200,799	204,796	226,040	267,622	302,909	240,225	288,784	318,321	308,831	366,715	329,610	344,758	342,439	459,576	376,761	7,571,151
Lillie	65,306	16,748	27,494	4,614	2,683	708	3,957	23,041	32,092	33,916	31,812	19,551	29,005	68,861	78,388	54,285	107,532	112,781	713,373
Lucy (McComber)	224,294	28,051	40,406	14,676				12,139	22,276	32,982	43,483	27,683	26,326	21,964				10,033	504,313
Manganese				397	1,484	3,111	1,367												6,359
Marquette (C)							5,229	20,441	7,060	70,128	23,692	16,802	9,555						152,907
Mesabi's Friend																5,503	10,540		16,043
Michigamme	385,975	57,272	43,712	42,533	25,935	12,373	48,790	58,726	36,448	56,999	80,777	23,169	1,894	935	1,610	3,214			880,362
Milwaukee	14,083	31,635	40,891	805	25,991	38,465	46,693	50,490	48,908	52,727	24,763								375,451
National	66,852	24,833	23,366	21,178	13,987														150,216
Negaunee								5,250	45,304	78,318	76,488	64,218	85,846	69,732	132,581	90,682	175,394	182,169	1,005,991
" Con. Wks.			1,177	10,394	43		1,094												12,708
New York (York)	924,927	50,074	56,806	1,517	1,677			5,128		12,844	2,422		11,220	25,000	21,487				1,113,102
N. Y. Hematite	35,482		2,105																37,587
North Republic									289										289
Northwest													1,687						1,687
Norwood								2,200	3,553										5,753
Nonpareil (St. Law.)			9,998	11,961				1,436											23,395
Ogden																		986	986
Palmer																	1,041		1,041
Pascoe			18,880		12,605	18,249	10,072												59,806
Pendill	20,508	13,586	9,987	318	1,594														45,993
Phenix (Dalliba)		10,986	44,836	1,687				1,605											59,114
Pioneer							5,140	1,203	9,066										15,409
Pitts. & L. Angel'e	507,637	18,060	14,326	27,259	86,922	111,051	131,731	191,120	223,600	229,070	261,681	241,605	287,517	351,973	355,453	313,555	342,251	489,685	4,184,496
Platt													2,676	5,448	41,226	13,198	11,296		73,844
Primrose																	6,040		6,040
Prince of Wales (A)											32,415								32,415
Quartz										491									491
Queen (A)									5,527	66,122	109,217								180,866
Queen Ir. M'g Co. (F)												479,509	379,719	106,864	220,298	160,817	323,057	239,774	1,910,038
Republic	1,193,613	233,786	235,109	152,565	277,757	250,835	241,161	220,624	235,062	287,390	220,065	191,127	167,991	64,195	105,719	174,027	127,360	124,342	4,502,728
Repub. Reduc. Co.								87	21,050	22,122	3,915								47,174
Richards								1,374										6,887	8,261
Richmond																	1,088	4,630	5,718
Riverside									5,622	3,712		6,783		43					16,160
Rolling Mill	220,146	1,668	163	1,528	1,820	3,437	4,403	1,058	402									3,975	238,600
Saginaw	389,981	30,793	16,276	9,108	946							4,320							451,424
Salisbury (B)	194,153	43,690	42,243	17,028	26,629	29,503	51,667	48,304	74,947	72,449	85,798								686,411
Sam Mitchell							8,823	8,411	546										17,780
Samson (Argyle)	223,507	4,584	12,421	15,700	1,334		1,133		4,512	2,796	1,218		600						267,805
Schadt																1,261			1,261
Section 12	5,357	13,243	3,287																21,887
South Buffalo (A)								4,964	24,706	69,359	146,383								245,412
Spurr	142,806	2,746	8,873	9,067			752												164,244
Star West (Wheat)	7,404	9,040	9,554	6,625	6,824	9,200	15,867	17,538	4,987	7,997	15,141	4,412			5,550	51,207	9,658	942	181,946
Taylor	1,110	10,559	15,146	6,155															32,970
Titan			1,778	13,128	19,411	23,340	13,865	16,003	2,846										90,371
Volunteer	223,853	39,276	41,456	19,414	11,748	5,679	24,034	47,486	56,321	60,156	141,524	92,699	127,130	69,561	26,946	32,672	53,216	1,617	1,074,788
Webster			4,443		934		6,229	2,054		448									14,108
West Republic		7,354	27,865	30,734	19,623	12,700	10,558	12,872	9,861	1,510									133,077
Wetmore			1,777	2,777	4,585	5,887	10,756	3,335	2,074	19,679									50,870
Wheeling					4,098	6,383		74											10,555
Winthrop											109,576	122,042	191,658	180,071	134,365	119,120	150,496	106,894	1,114,222
Total	14,019,480	1579,834	1829,394	1305,425	1558,034	1430,422	1627,380	1851,634	1923,727	2642,813	2993,664	2512,242	2666,856	1835,893	2059,330	2097,838	2604,221	2715,035	49,253,222
Mesabi Range.																			
Adams																59,141	234,562	175,802	469,505
Aetna (Lowmore)														1,645			17,723		19,368
Auburn															108,210	376,970	131,478	175,263	791,921
Biwabik														151,500	90,048	247,069	242,565	427,464	1,158,646
Canton														24,416	213,853	359,020	16,261		613,550
Cincinnati														26,372		17,187	57,324	32,912	133,795
Cloquet (Vega)															5,628	47,700	96,280	12,215	161,823
Commodore														65,137	7,213		22,063	60,798	155,211
Duluth														37,626					37,626
Fayal																136,601	248,645	642,939	1,028,185
Franklin														46,617	223,399	286,423	231,086	30,128	817,653
Genoa																	17,136	309,514	326,650
Hale														3,616	24,167	31,004	70,006	13,728	142,521
Lake Superior																58,123	67,659	259,912	385,694
Mahoning																117,884	167,245	519,892	805,021
Minnewas														13,858	2,140				15,998
Mtn. Iron (& Rath)													4,245	119,818	573,440	371,274	142,021	773,538	1,984,336
Norman															38,999	93,392	77,523	101,077	310,991
Ohio																28,943	69,925	47,350	146,218
Oliver (I)														123,015	505,955	500,377	808,291	601,072	2,538,710
Penobscot																		11,933	11,933
Roberts																		18,614	18,614
Sellers																47,433	153,037		200,470
Sparta																		66,722	66,722
Williams (N. Cin'ti)																3,046	11,249		14,295
Total													4,245	613,620	1793,052	2781,587	2882,079	4280,873	12,355,456
Miscellaneous					1,879	441													2,320

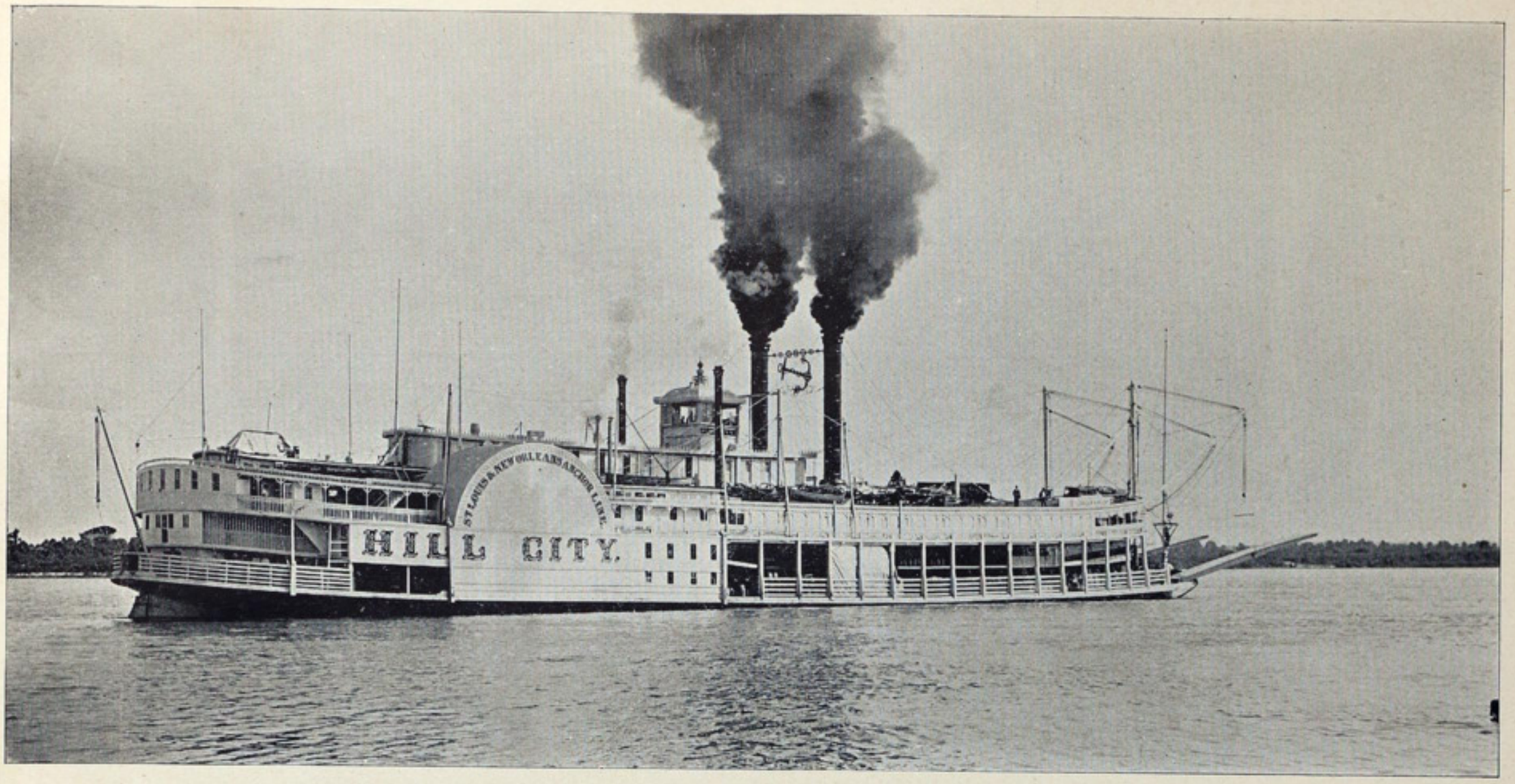
NAME OF MINE.	Prior to 1881	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	TOTALS.
Menominee Range.																			
Antoine																27,931	110,821	98,847	237,599
Appleton													4,377	5,618		2,107			12,102
Aragon										1,745	46,609	96,829	167,948	127,901	138,209	183,296	95,809	149,594	1,007,940
Armenia										50,275	26,649					2,015			78,939
Beta							1,585	1,226				1,400							4,211
Breen	17,430																		17,430
Brier Hill			10,593	4,388															14,981
Calumet			5,847	29,239	3,627														38,713
Chapin	34,556	134,521	247,506	285,830	290,972	157,455	198,871	336,128	290,871	518,990	742,843	488,749	660,052	489,134	235,895	618,589	420,318	643,402	6,774,682
Claire													57,352	9,612					66,964
Columbia (H)			15,948	4,334	6,774		14,282	2,377	10,936	11,385	60,133	70,770	57,682	22,426	10,300	70,967	87,202	24,623	470,039
Commonwealth	9,643	97,410	115,862	21,493	34,622	42,947	51,189	56,600	61,818	103,515	116,786	134,982	249,113	151,291	174,921	208,880	93,707	98,283	1,828,071
Cornell	30,856	11,816					4,566	2,064											49,302
Crystal Falls			1,341								3,974					13,037	44,526	95,210	158,088
Cundy (Quinnesec)	120,315	43,711	44,240	21,676	16,995	14,110	13,442	6,585	2,249							761	3,395	41,942	329,421
Curry (G)	34,654	17,534	13,374	3,676	10,079	4,897			5,376	23,722	72,162	100,681	125,773						416,928
Cyclops (G)	66,554	12,644	18,287	22,675	24,099	49,897	37,189	14,297	14,693	6,101	7,361	10,599	1,697						286,093
Delphic				3,410	508	9,880	17,648	2,272									52		33,770
Dunn								24,677	118,096	151,828	156,963	162,721	133,666	58,590	24,538	90,885	47,081	31,062	1,000,107
Emmett	66,007	648																	66,655
Fairbank			8,045	455															8,500
Florence	14,143	100,501	160,155	40,232			8,210	79,399	142,585	196,269	218,570	48,806	48,246	9,634	2,726	22,820	35,136	37,594	1,165,026
Great Western			587	22,825	20,710		22,267	23,239	21,860	38,454	72,546	62,464	87,487	661			14,643		387,743
Groveland												1,049							1,049
Half and Half										5,961	1,496	67							7,524
Hamilton							872	600	8,801	8,347	17,072	58,197	2,183						96,072
Hemlock												35,531	65,459	11,323		949	94,645	96,032	303,939
Hersel											955								955
Hiawatha														1,683		1,201			2,884
Hollister											2,020	1,057	1,021						4,098
Hope													15,543	2,275					17,818
Indiana			4,280	4,362	635	2,739	5,854												17,871
Iron River			29,115	100,369	52,581	55,693	78,591	83,018	110,000	179,238	155,458	59,345	1,176						904,587
Keel Ridge	11,496	19,511	23,425	5,033									5,997	3,298		19,441			88,201
Lee Peck (D)													2,844						2,844
Lincoln												1,813	26,019	8,757					36,589
Loretto														8,131	55,983	53,160	34,334	54,104	205,712
Ludington	8,816	3,374	52,152	102,632	101,165	124,194	74,454	101,653	61,883	116,297	97,355	141,303	15,777	109	354				1,001,518
Manganate											6,844								6,844
Mansfield											18,303	49,836	69,259	69,558				37,182	244,138
Mastodon			3,477	18,577	18,187	11,737	41,640	48,792	51,463	63,511	66,526	45,370	9,150	23,483		23,733	60		425,708
Metropolitan			23,854	36,643	27,577		6,393	9,070	3,490										107,027
Michigan Explo. Co.														505	77	1,071		216	1,869
Millie (Hewitt)		4,352	9,500	7,516	7,927	4,627	5,517	1,163	11,124	12,274	39,232	5,889	6,780		13,062	10,921	21,815	10,374	172,076
Monitor (Lamont)										12,348	31,139	26,226	42,819	13,777	2,600				128,909
Nanaimo			2,480	29,221	37,620		5,400	30,460	5,744		3,441	13,200							127,566
Northwestern				7,202	10,004														17,206
Norway (G)	278,960	137,077	165,547	114,836	71,710	67,741	93,878	95,726	87,260	68,044	61,717	4,089	44,767						1,291,352
Paint River			6,515	5,973	11,652	2,373	13,933	10,240	12,506	32,700	62,654	45,435	18,390						222,371
Penn Iron M'g Co.														280,450	175,274	290,622	179,917	237,886	1,164,149
Perkins	62,661	60,406	73,648	76,514	38,120	18,020	12,852	10,834	16,684	12,354	11,971					2,161			397,225
Perry				3,138															3,138
Pewabic											26,991	64,507	115,273	165,745	304,010	262,551	273,587	279,855	1,492,519
Selden							790	1,302											2,092
Sheridan										1,102	595	7,137	45,745	2,234		16,754	3,419	146	77,132
South Mastodon									2,722	4,005	1,476								8,203
Stephenson	23,887	10,856					1,018	3,589											39,350
Sturgeon River								6,829	7,800	4,775									18,404
Vulcan (G)	187,343	85,274	94,042	79,874	101,722	124,125	143,930	205,036	129,541	153,900	104,996	78,967	179,904						1,668,654
Walpole								1,740	900	9,614	2,940	3,895							19,089
Youngstown			6,198	15,292	8,344		25,635	34,418	12,699		44,460	3,705				13		661	151,425
Total	967,321	739,635	1136,018	1047,415	895,634	690,435	880,006	1193,343	1191,101	1796,754	2282,237	1824,619	2261,499	1466,197	1137,949	1,923,798	1,560,467	1,937,013	24,931,441
Vermillion Range.																			
Chandler									54,612	306,220	336,002	373,969	651,655	435,930	558,050	605,024	471,545	438,365	4,231,372
Minnesota					62,124	225,484	304,396	394,252	457,341	535,318	532,000	517,570	498,353	370,303	390,463	432,760	448,707	592,196	5,761,267
Pioneer										3,144	12,012	3,079	2,651			40,054	149,073	207,103	417,116
Zenith													14,901	14,388			18,765	40,817	88,961
Total					62,124	225,484	304,396	394,252	511,953	844,682	880,014	894,618	1167,650	820,621	948,513	1,077,838	1,088,090	1,278,481	10,498,716
Gogebic Range.																			
Anvil								10,075	24,676	47,000	45,690	73	42,090		13,297	68,064	57,483		308,448
Ashland						6,741	74,015	175,563	174,183	257,915	435,949	267,439	231,896	66,067	83,020	126,096	91,149	111,625	2,101,658
Atlantic								1,369								70,989	60,727	50,307	183,392
Aurora						5,422	94,553	159,252	179,937	199,865	246,695	83,554	319,482	179,028	203,152	245,883	187,169	160,122	2,270,114
Bessemer							4,788	16,101											20,889
Blue Jacket								1,799											1,799
Brotherton							8,880	21,721	40,639	53,267	80,486	46,574	130,833	18,905	47,148	40,587	50,490	46,186	585,646
Cary (and Superior)										56,542	116,203	121,186	106,484	28,578	16,559	52,349	38,821	37,308	574,030
Chicago																	504		504
Colby (E)					1,022	84,302	257,432	258,518	285,880	136,833	193,038	9,619	69,968	59,346	32,616		48,492	22,921	1,459,987
Comet											2,882	10,144	54,779	9,604	11,782				89,191
Davis											1,497		21,754	15,210		10,253			48,714
Eureka											23,794	13,907	10,655	31,385	18,329	26,105	4,544		128,719
Father Hennepin									28,721	76,545	63,903	15,759							184,928
Federal											21,150	6,778							27,928
First National								1,997											1,997
Germania						5,468	19,734	61,714	53,918	103,169	52,000	22,383	4,283	7,964				1,015	331,648
Imperial													8,515						8,515
Iron Belt									30,000	51,551	110,368	1,506	161,635	23,976	45,109	148,228	81,351	96,763	750,487
Iron Chief							9,950	2,249											12,199
Iron Chief No. 2							551												551
Ironton							18,424	24,762		8,635	6,247	300							58,368
Jack Pot													3,944	1,651				1,265	6,860
Kakagon							18,497	52,179	1,228										71,904
Mikado																4,788		11,397	16,185
Montreal							23,013	43,989	38,015	42,724	16,728	70,108	58,728	34,299	46,037	138,882	131,531	191,106	835,160
Newport							20,184	75,660	69,145	36,987	71,488	105,606	165,962	109,718	150,392	157,821	142,369	150,979	1,256,311
Nimikon							4,105	24,217	1,313										28,635
Norrie						15,419	124,844	237,254	412,196	674,394	906,728	758,572	985,216	472,062	621,608	738,480	329,068	604,281	6,880,122
Odanah							13,714	30,475	5,412	13,354	1,065		6,711	3,956	2,437				77,124
Pabst						1,103	17,979	19,906	49,976	116,376	172,060	130,226	113,245	104,510	206,074	219,960	68,984	220,496	1,440,895
Palms								1,414	9,725	35,245	50,604	32,227	102,382	2,658	37,911	46,965	114,108	207,153	640,392
Pence									26,687	574							13,185	120	40,566
Ruby (Puritan)							16,388	45,000	3,058	9,472	11,694	913							86,525
Section 33										73,370	126,963	38,576	14,681						253,590
Shores																	12,196	16,102	28,298
Sparta													2,912			1,950			4,862
Sunday Lake						1,405	10,963	18,137			6,010	64,902	56,046	22,876	34,323	20,970	89,441	45,815	370,888
Superior							2,690	27,763			36,675	10,710	13,192		30,597				121,627
Tilden												28,415	233,356	135,118	209,077	418,188	250,205	276,890	1,551,249
Trimble							10,780	12,764	2,387										25,931
Tyler's Forks											10,683								10,683
Valley							1,878												1,878
Windsor										14,576	37,210	97	53,242	2,474		11,438	28,154	385	147,576
Total					1,022	119,860	753,362	1322,878	1437,096	2008,394	2847,810	1839,574	2971,991	1329,385	1809,468	2,547,976	1,799,971	2,258,236	23,047,023
GRAND TOTAL	13,010,705	2319,469	2965,412	2352,840	2518,693	2466,642	3565,144	4762,107	5063,877	7292,643	9003,725	7071,053	9072,241	6065,716	7748,312	10,429,037	9,934,828	12,469,638	120088,178

A—Now Queen I. M. Co. F—Succeeds Buffalo Mining Co. B—Now Iron Cliffs. K—Under Clev'd-Cliffs I. Co after '95. I—Mesabi Mtn. and Lone Jack. C—1893 and later in Winthrop. D—Cherry Valley Ore. E—Includes Tilden up to 1891. G—1893 and later under Penn Iron Mining Co. H—Formerly Shafer, Shelden, and Union.



NORTH GERMAN LLOYD EXPRESS STEAMER KAISER WILHELM DER GROSSE.

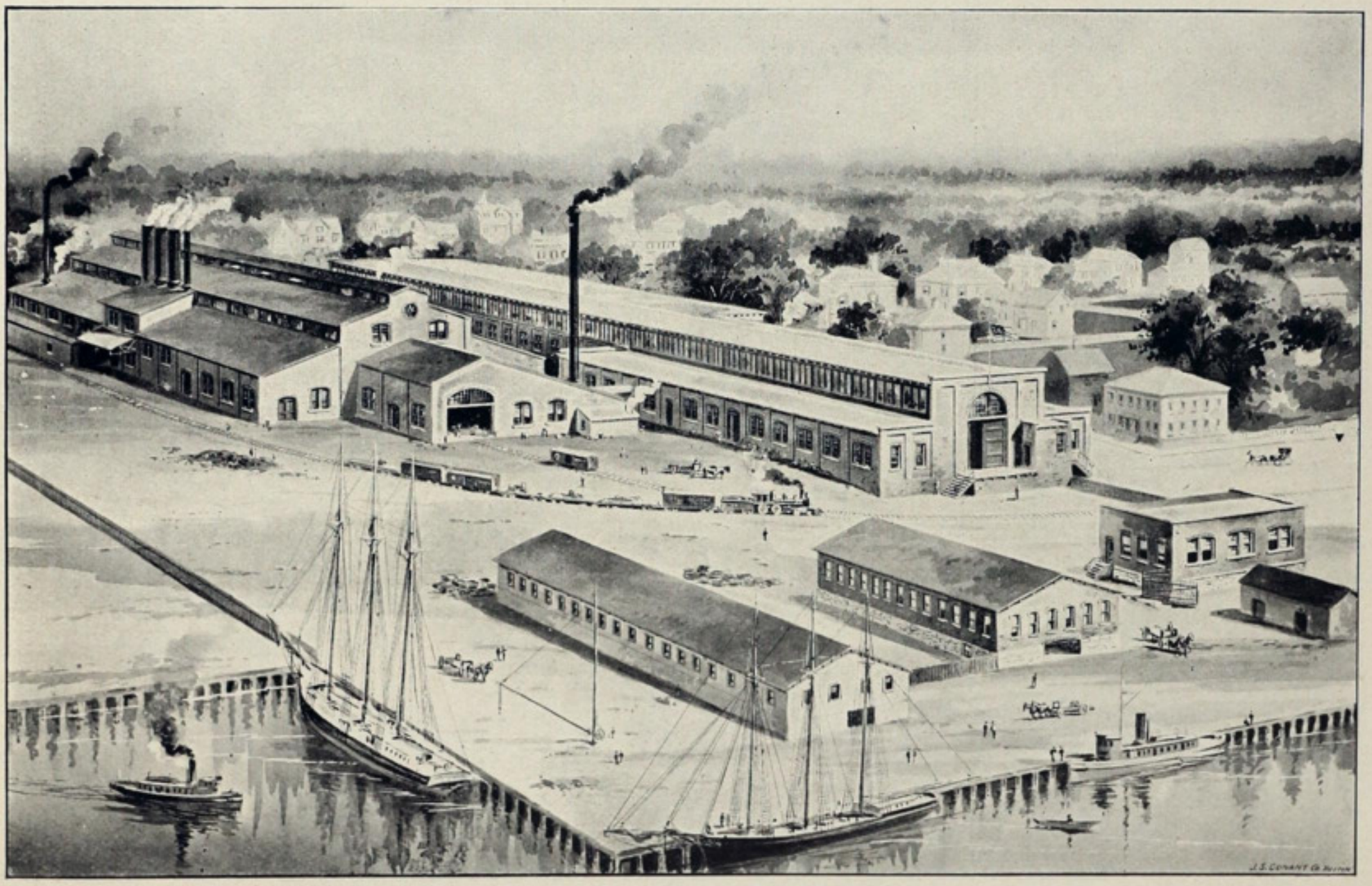
(The largest and fastest steamship in the world.)



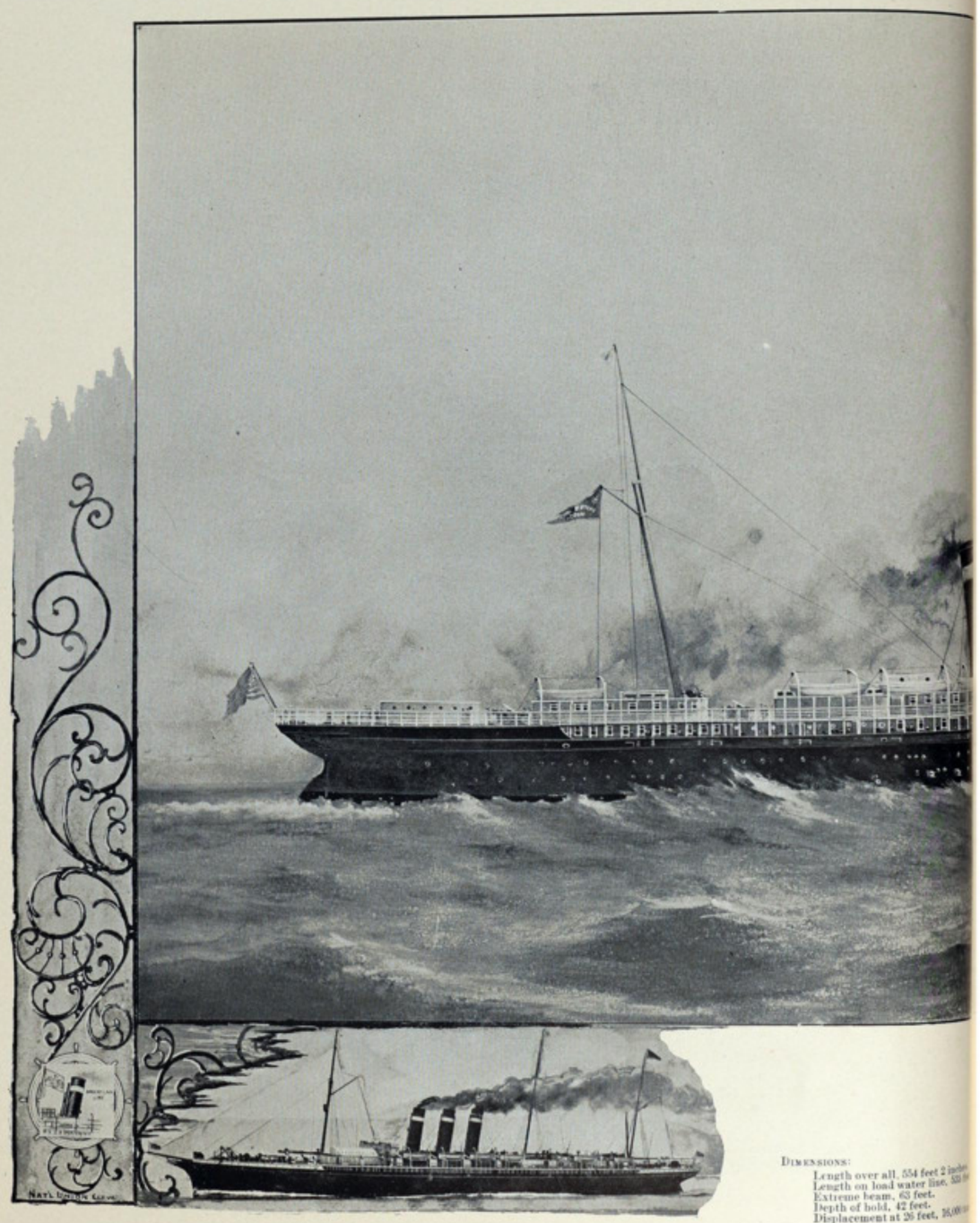
MISSISSIPPI RIVER STEAMER "HILL CITY."

(BUILT BY D. S. BARMORE, MADISON, IND.)

LENGTH, 320 FEET; BEAM OVER GUARDS, 80 FEET; TONNAGE, LOADED, 2,200 TONS.

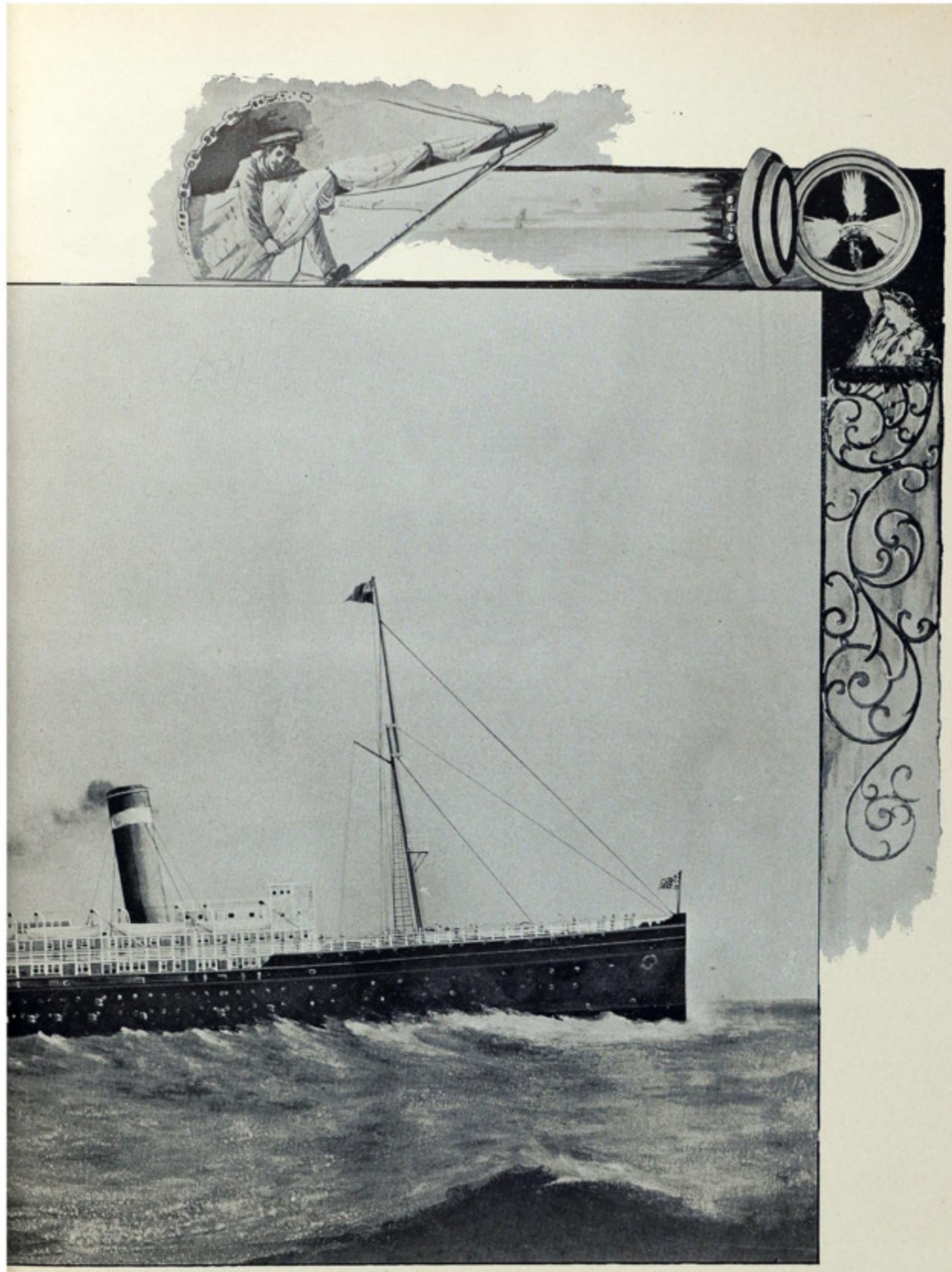


MANUFACTURING PLANT OF THE HYDE WINDLASS CO.



Dimensions:

Length over all, 554 feet 2 inches.
Length on load water line, 550 feet.
Extreme beam, 63 feet.
Depth of hold, 42 feet.
Displacement at 26 feet, 36,000 tons.



Supplement to Marine Review, Cleveland, O., Vol. 17, No. 3, January 20, 1898.

TWIN-SCREW TRANS-ATLANTIC STEAMSHIP ST. PAUL.

(INTERNATIONAL NAVIGATION COMPANY—AMERICAN LINE.)

uilt by the William Cramp & Sons' Ship and Engine Building Company.

Power:

Two quadruple expansion, vertical six-cylinder engines; Boilers—six double ended and four single-ended; developing 20,000 horse-power and giving a minimum speed of 20 knots an hour.

A GROUP OF SHIP BUILDERS.

C. B. Orcutt, Newport News S. B. & D. D. Co.
Joel Brown, Brown Dry Dock Co.
W. I. Babcock, Chicago Ship Bldg. Co.
T. W. Hyde, Bath Iron Works.
A.I. McLellan, McLellan Dry Dock Co.
Alex. McDongall, American Steel Barge Co.
Wm. Rogers, Bath, Me.
N. A. Jacobs, Portland, Me.
F. W. Wheeler, F. W. Wheeler & Co.
Wentworth Allen, Athens, N. Y.
Hugh Ramsay, Perth Amboy, N. J.
James Wallace, Cleveland Ship Bldg.
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J. B. Nutt, Perry, Me.
John Craig, Craig Ship Bldg. Co.
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I. M. Scott, Union Iron Works.
L. J. Nilson, Jos. Thomas & Son.
H. M. Hanna, The Globe Iron Works.

MARINE BUSINESS MEN OF THE UNITED STATES.

Chas. M. Jarvis, Berlin Iron Bridge Co.
Emil Boas, Hamburg-American Line.
R. M. Davenport.
Frank S. Manton, American Ship Windlass Co.
James Graham, Jas. Graham & Co.
John Deming.
Wm. C. Munroe, H. W. Johns Mfg. Co.
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M. H. Tarbox, Boston & Lockport Blk. Co.
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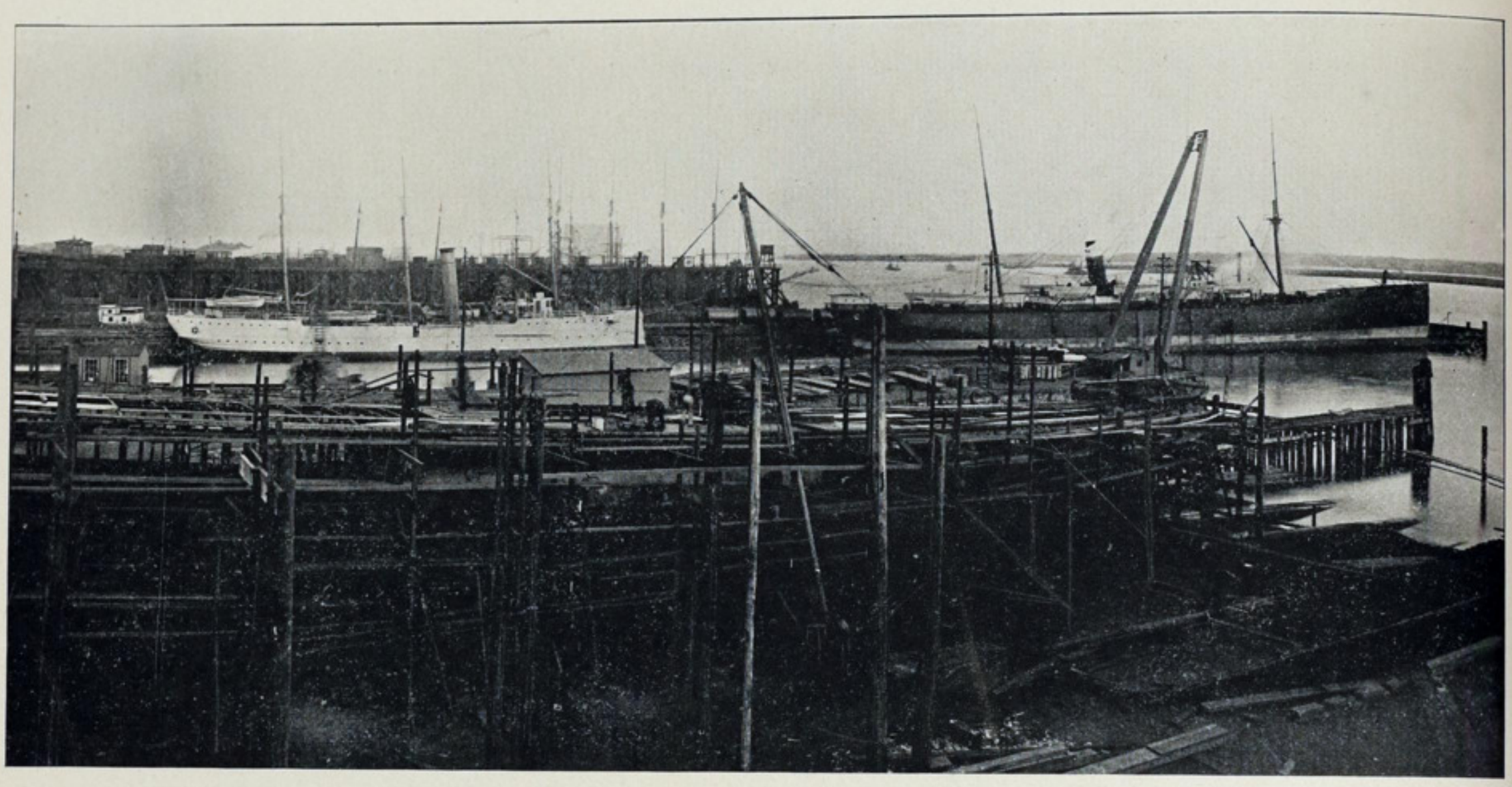
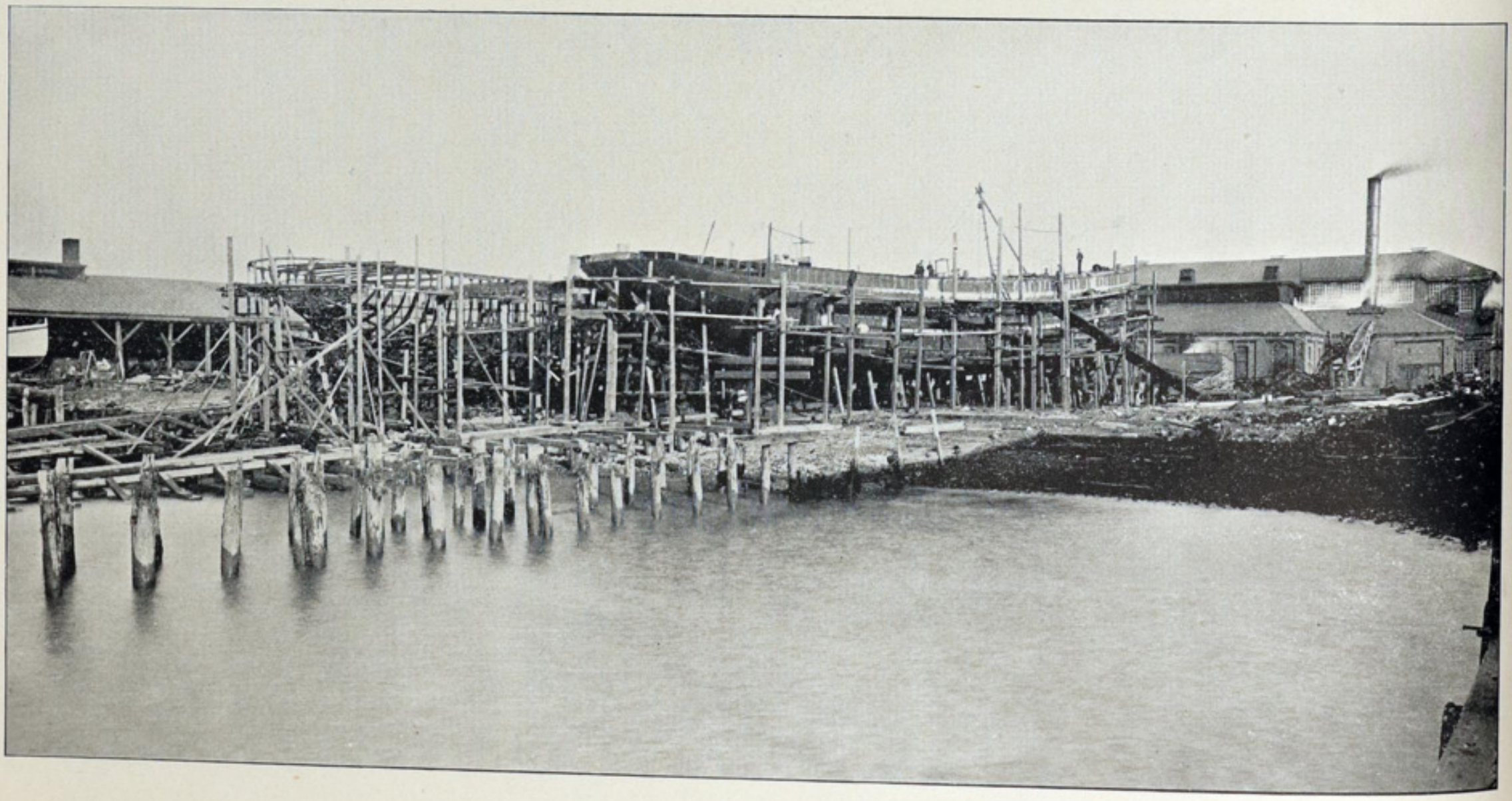
Fred H. Pell, Marine Mfg. & Supply Co.
R. A. Cottrell, Marine City, Mich.
C. W. Elphicke.
A. Wells Case, Highland Park, Conn.
W. H. Brown, Pittsburg, Pa.
James R. Raymond.
J. R. Andrews, Hyde Windlass Co.
W. O. Ashley, Ashley & Dustin.
Miles Berry.



WM. CRAMP & SONS SHIP AND ENGINE BUILDING CO., PHILADELPHIA.

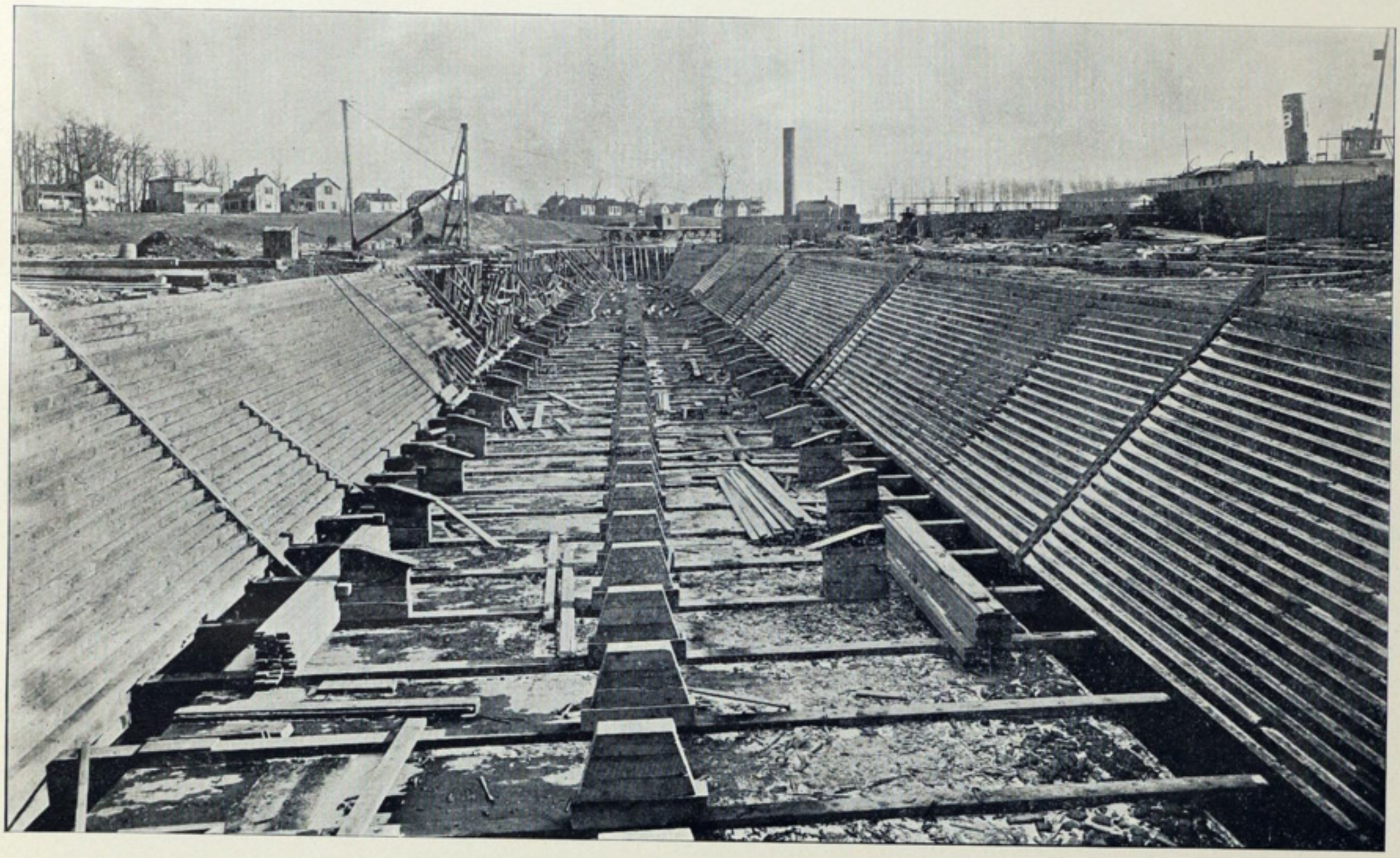
SHOWING BATTLE SHIP AND MERCHANT STEAMER UNDER CONSTRUCTION



J. H. DIALOGUE & SON, CAMDEN, N. J.

SHOWING A FIRE-BOAT AND SMALL PASSENGER STEAMER UNDER CONSTRUCTION

YARDS OF THE UNITED STATES.



CLEVELAND SHIP BUILDING CO., LORAIN, O.

NEW SHIP BUILDING PLANT SHOWING THE THIRD LARGEST DOCK IN THE UNITED STATES.

THE GLOBE IRON WORKS COMPANY, CLEVELAND, O.

SHIP AND DOCK YARD HAS A WATER FRONTAGE OF 2,300 FEET.

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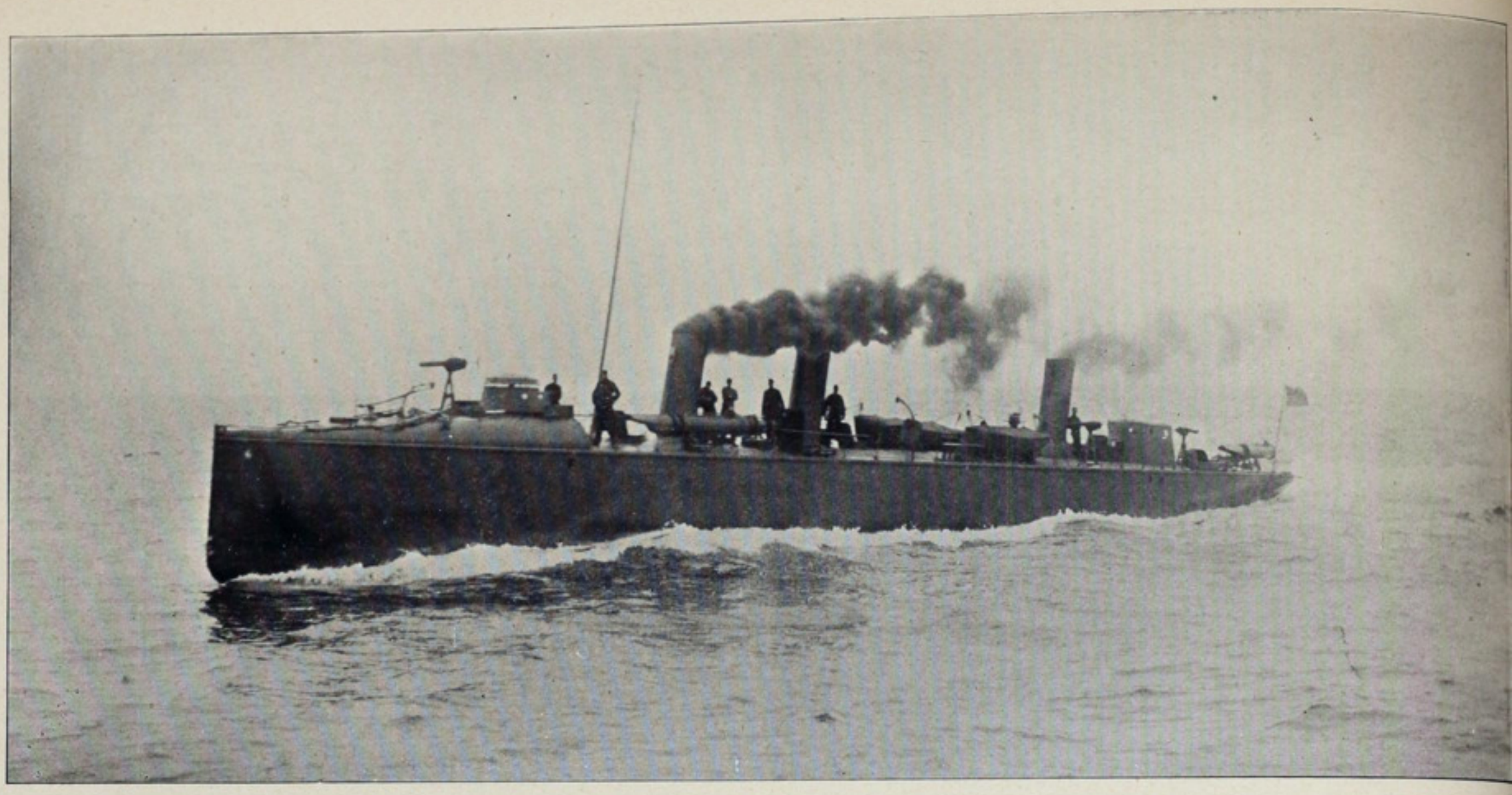
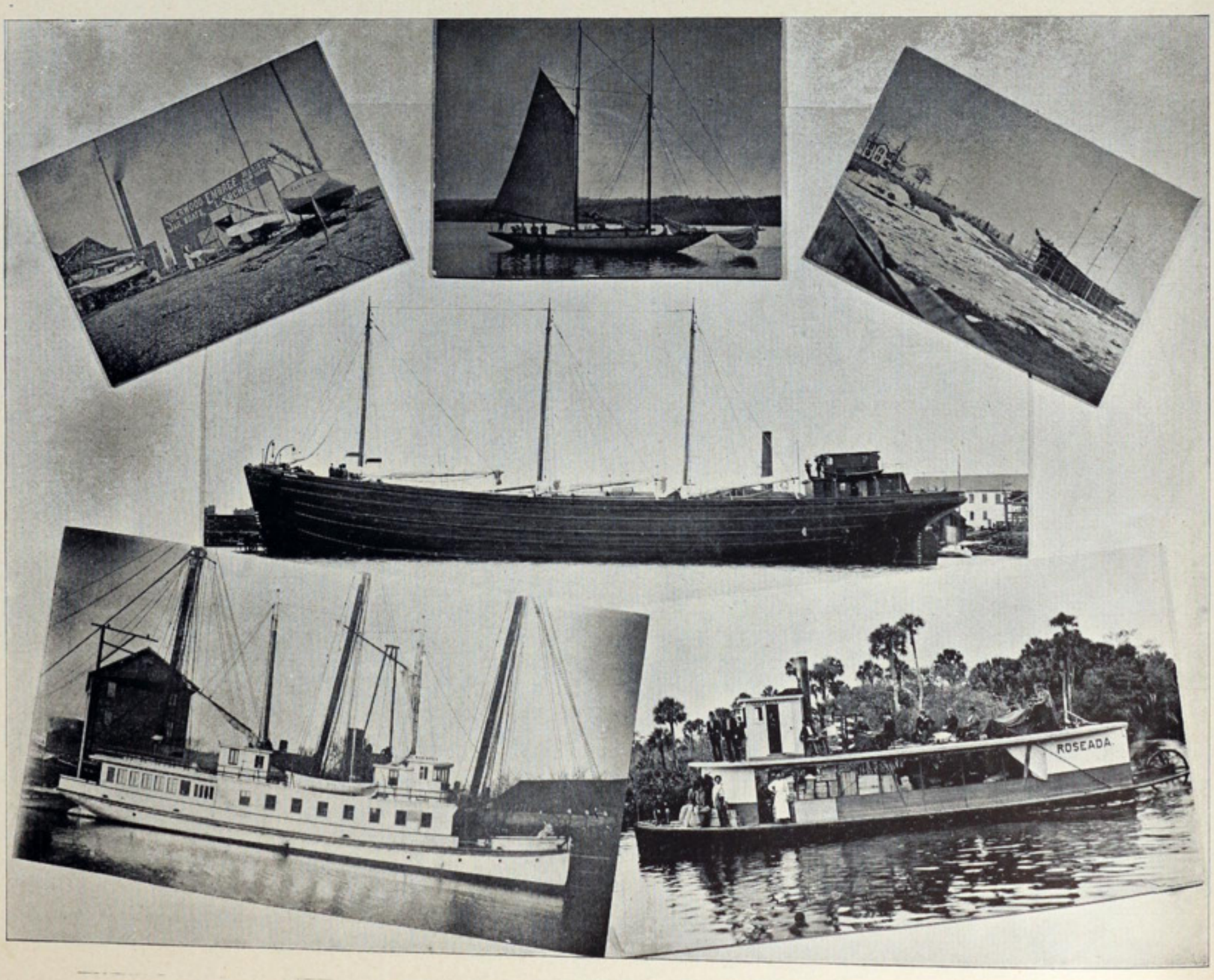


U. S. TORPEDO BOAT "PORTER."

NOTE.—Nineteen vessels of this class were built in private ship yards of the United States during the past two years.



MISCELLANEOUS CRAFTS.

EMBREE BOAT YARD, QUINCY POINT, MASS. YACHT BUILT BY E. G. HEALD, AUBURN, N. Y. SCHOONER VIATOR, BUILT BY J. B. NUTT, PERRY, ME.

WOODEN TOW BARGE, BUILT AT THE PALMER YARD, NOANK, CONN.

EXCURSION STEAMER, BUILT AT NOANK, CONN. FLORIDA RIVER STEAMER ROSEADA.

MERCHANT WORK IN COAST SHIP YARDS.

BATH IRON WORKS, BATH, ME.

	DIMENSIONS.			VALUATION.	OWNERS.
Steel cargo steamer...	290	42	25.8	$200,000	Miller, Bull & Knowlton, New York.
Steel steam yacht.....	300	..	....	400,000	Col. O. H. Payne, New York.

NATHANIEL T. PALMER, BATH, ME.

5-masted schooner	284	44	22	$90,000	N. T. Palmer, Bath, Me.

ARTHUR SEWALL & CO., BATH, ME.

Steel sailing ship.....	312	45	25	*$150,000	Arthur Sewall & Co., Bath, Me.

ROBT. PALMER & SON, NOANK, CONN.

Sea-going barges (ten)	200	35	17	*$250,000	Reading Railroad Co.
Railroad floats (three)	235	..	....	*45,000	.....
Steamer (wooden)	100	..	....	*35,000	.....
Steam yacht	80	..	....	20,000	.....

GEORGE LAWLEY & SON CORP'N, SO. BOSTON, MASS.

Steam yacht, composite	111	15¼	10	$32,000	R. B. Keyser, Baltimore, Md.
Steam yacht, wooden.	119	16	10½	35,000	F. B. McQuesten, Boston, Mass.
Schooner yacht	59	14	8	10,000	John Richmond, Providence.

NICHOLAS A. JACOBS, PORTLAND, ME.

Steam yacht	65	10½	6	$25,000	Lincoln Cummings, Portland.

W. B. STEARNS, MARBLEHEAD, MASS.

Small yachts	...	....	....	$35,600	Various parties.

A. & M. GAMMAGE, SO. BRISTOL, ME.

Steamer	66	15	6½	$6,000	S. Skillings, Portland, Me.

ARTHUR D. STORY, ESSEX, MASS.

Fishing schooners	85	22	9	*$15,200	S. Smith & Co., Gloucester
" "	86	22	9	*16,000	J. Pew & Son, Gloucester
" "	82	22	8.8	*14,800	Capt. D. O'Neal, Gloucester.
" "	106	24	10	*20,000	P. H. Prior, Boston, Mass.
" "	73	18	8	*9,000	W. H. Wiley & Co., Boston.

ELMER A. ELY, MIDDLETOWN, CONN.

Steamer	77	14	5½	$10,000	H. Bullard, Middletown.

FORE RIVER ENGINE CO., WEYMOUTH, MASS.

Launch	52	9	4	$2,500	Miner Robinson, Boston.

SHERWOOD EMBREE & BRO., QUINCY POINT, MASS.

Small yachts (three)..	...	....	....	$2,900	Boston parties.

RICE BROS., E. BOOTHBAY, ME.

Yachts (three)	...	....	....	$7,000	N. Y. and Boston parties.

S. GILDERSLEEVE & SONS, GILDERSLEEVE, CONN.

Coal barges (three)....	121	27	12	$17,000	.....

THE WM. CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.

Steel P. & F. steamer	360	50	32	*$500,000	N. Y. & Cuba Mail S. S. Co.
" " "	360	50	32	*500,000	N. Y. & Cuba Mail S. S. Co.
Steel steam yacht.....	170	23¼	15	125,000	Thos. McKean, Philadelphia.

ROACH'S SHIP YARD, CHESTER, PA.

Ferry boat	188	36	14½	$110,000	Brooklyn & N. Y. Ferry Co.
Steel pass. ship.....	318	46	29	325,000	Maine Steamship Co., Portland, Me.
Steam yacht.....	120	20	12	45,000	Gardner & Cox, New York.

CRESCENT SHIP YARD, LEWIS NIXON, Propr., ELIZABETH, N. J.

Steamer Aschenbroedel	135	32	10	$40,000	City of New York.
Stern-wheel Mercedes.	75	18	5	25,000	Aug. T. Hanabergh, S. A.
" Jennie M.	80	15	3	8,500	Heilprin Exploration Co., Philadelphia, Pa.
" Playade Oro	60	10	2½	6,000	Playade Oro Mining Co., Ecuador.
" Amarilis.	70	15	3	8,000	J. A. McPherson, Alaska.
" Antioquia	130	28	5	27,500	Senor B. Olozaga, U. S. Columbia.
Paddle-wheel Alicia....	33	8	3	3,750	J. A. McPherson, Alaska.
Steel steam yacht.....	150	19	...	75,000	Larchmont Club member.

W. & A. FLETCHER CO., HOBOKEN, N. J.

Side-wheel steamer ...	248	35	62.12	$152,000	Catskill & N. Y. Steamboat Co., New York.

THE CHAS. HILLMAN SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.

Sea-going tug	162	29 1-3	19¼	*$65,000	J. B. King Trans. Co., New York.
" " "	138	26 1-3	16	*50,000	Staples Coal Co., Taunton, Mass.

NEAFIE & LEVY SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.

Fr'ht & pass. steamer.	115	23	7½	*$60,000	B. F. Watkins, Odessa, Del.

HARLAN & HOLLINGSWORTH CO., WILMINGTON, DEL.

St. st'm yacht Niagara	272	36	28	$300,000	Howard Gould, New York.
Sea-tug Gettysburg ...	170	29	....	*75,000	P. & R. R. R. Co.
Knockabouts (six)	33	....	....	*30,000	Corinthian Yacht Club, Philadelphia, Pa.

PUSEY & JONES CO., WILMINGTON, DEL.

Ferry boat.....	102	23	10	$32,000	U. S. Quartermaster, N. Y.
Tug boat.....	110	25	14	50,000	N. Y., N. H. & H. R. R. Co.
" "	110	25	14	50,000	" " " " "

JACKSON & SHARP CO., WILMINGTON, DEL.

Tug Alice	101	23	10¼	*$50,000	Chesapeake & Ohio Ry., Richmond, Va.
Dredge steamer	140	32	11	.....	The Bucyrus Co., So. Milwaukee, Wis.
Dump scows (two).....	110	34	12	*20,000	J. H. Finner, Jersey City.

PERTH AMBOY DRY DOCK CO., PERTH AMBOY, N. J.

Scows and barges (six)	...	....	....	$28,000	Various parties.

FILLMORE A. BAKER, PATCHOGUE, L. I., N. Y.

Launches (two)	40	14	5	$5,000	.....

DAIMLER MOTOR CO., STEINWAY, L. I., N. Y.

Motor launch	30	....	....	*$5,000	Harper & Bro., New York.

* Estimated.

E. G. HEALD, AUBURN, N. Y.

Steam and sail yacht. ...	....	....		$7,000	Auburn parties.

CHAS. N. SOLHEIM, GRAVESEND BEACH, N. Y.

Auxiliary sloop	34	9	4½	$2,000	J. N. Newbury, New York.

JOS. THOMAS & SON, WINAN'S COVE, BALTIMORE, MD.

Steam yacht	120	....	....	$25,000	Wm. H. Evans, Baltimore.

GAS ENGINE & POWER CO. AND SEABURY & CO., MORRIS HEIGHTS, NEW YORK, N. Y.

Steam yachts (two)....	103	14-15	5	*$80,000	.....
Steam yacht.....	65	11	4	*25,000	.....
Steel lighter	115	30	11	*30,000	.....

WENTWORTH ALLEN, ATHENS, N. Y.

Tug boat	70	18	8	$15,000	Owner's name withheld.

DAVID S. BARMORE, MADISON, IND.

Pass. steamer	...	....	....	$80,000	Eagle Packet Co., St. Louis.

MISSISSIPPI VALLEY MARINE RAILWAY & DOCK CO., MOUND CITY, ILL.

Fr't & pass. steamer..	150	30	4	$12,500	Missouri Pac. Ry. Co., St. Louis, Mo.

A. AXTON & SON, WEST BROWNSVILLE, PA.

Pass. & fr'ht steamer.	170	29	5	$40,000	P. B. S. & M. Packet Co., Brownsville, Pa.

GODFREY MARINE WAYS, LYONS, IA.

Raft boat May Libby.	85	21	....	$7,000	Capt. Geo. Winans, Waukesha, Wis.

MARMET-SMITH CO.'S YARD, RAYMOND CITY, W. VA.

Tow-boat Otto Marmet	150	25	4½	$20,000	Marmet-Smith Coal & M. Co.

D. M. SWAIN, STILLWATER, MINN.

Stern-wheel steamer ..	105	20	4½	$14,000	Foley Bean Lumber Co., Milacca, Minn.
" " ..	153	28	....	29,000	Kootenai Trans. Co., Jennings, Mont.
" " ..	140	21	....	12,000	Inter-State Trans. Co., Stillwater, Minn.
" " ..	80	18	....	3,000	L. Sargent, Rockford, Ill.

SCHULTZ BRIDGE & IRON CO., PITTSBURG, PA.

Car transfer barge....	300	46	10	*$80,000	Inter-State Trans. Co., St. Louis, Mo.

UNION IRON WORKS, SAN FRANCISCO, CAL.

Steamship Maui	167	32	16	$110,000	Wilder S. S. Co., Honolulu, H. I.
" Senator	288	38	19	260,000	Pacific Coast S. S. Co., San Francisco, Cal.
" St. Paul ...	288	38	19	275,000	Alaska Commercial Co., San Francisco, Cal.
Paddle steamer	150	30	8	60,000	Alaska Commercial Co., San Francisco, Cal.
Ferry steamer	265	40	17	220,000	Southern Pacific Co., San Francisco, Cal.

CALIFORNIA NAV. & IMPROVEMENT CO., STOCKTON, CAL.

Passenger steamer.....	210	32	8	$100,000	Cal. Nav. & I. Co., Stockton, Cal.
" "	150	32	4½	30,000	Cal.-Yukon Trading Co.
Barges (two)	165	34	5½	15,000	Cal.-Yukon Trading Co.
"	200	40	7½	10,000	Cal. Nav. & I. Co., Stockton.
"	180	36	7	7,500	Cal. Nav. & I. Co., Stockton.

HAY & WRIGHT, ALAMEDA, CAL.

Steam schooner	205	37	14	$85,000	Capt. Chas. Nelson, San Francisco, Cal.

WEST & SLADE, ABERDEEN, WASH.

Schooner	160	40	12½	$35,000	Builder.

P. G. COPP, N. SEATTLE, WASH.

Steel stern-wheel	75	16	....	$9,000	James Casey, Seattle, Wash.
Stern-wheel	50	14	....	4,000	W. J. Walch, Seattle, Wash.

H. R. KINGMAN, LAKESIDE, WASH.

Pass. steamer Swan....	64	14	6½	$6,000	Builder.

SIDNEY H. McLANE, BALLARD, WASH.

Steel Pass. steamer...	70	17¾	4½	$15,000	Chicago-Yukon Comml. Co.

COLUMBIAN IRON WORKS, BALTIMORE, MD.

Sea-going tug.....	132	27	16	$95,000	Consolidated Coal Co.

R. M. SPEDDEN CO., BALTIMORE, MD.

Tug boat.....	100	20	11	$40,000	New York parties.
" "	90	19	10	35,000	Philadelphia parties.

THOS. McCOSKER & CO., BALTIMORE, MD.

Tug boat.....	70	16	6½	$25,000	P. Dougherty & Co.

J. H. DIALOGUE & SON, CAMDEN, N. J.

Steel elevators (2).....	150	32	16	$90,000	International Elevating Co.

IOWA IRON WORKS, DUBUQUE, IA.

Steamer.....	80	17	3¾	$40,000	Miss. River Com.

J. N. ROBINS CO., ERIE BASIN, NEW YORK.

Steam yacht.....	180	30	11	$50,000	Col. E. W. Bliss.

WEST SEATTLE SHIP BUILDING CO., W. SEATTLE, WASH.

Stern-wheel steamers (3)	85	21	4	$60,000	Not named.

HALL BROS., PORT BLAKELEY, WASH.

Schooner.....	170	37	13	$43,000	Hall Bros., San Francisco.

ALASKA EXPLORATION CO., SAN FRANCISCO, CAL.

T. P. H. Whitelaw, Supt., Spear st., near Harrison.

Stern-wheel steamers (3)	180	35	7	$150,000	Alaska Ex. Co.

MORAN BROS., SEATTLE, WASH.

Stern-wheel steamers (6)	190	...	...	*$240,000	Yukon Co.
" " " (6)	260	40	...	360,000	" "
" " tugs (2).....	120	...	..	60,000	" "

*Estimated.

NAVAL AND GOVERNMENT WORK IN COAST SHIP YARDS.

NEWPORT NEWS SHIP BUILDING AND DRY DOCK CO., 1 BROADWAY, NEW YORK, N. Y. AND NEWPORT NEWS, VA.

	Length, water line.	Beam.	Draft.	Disp.	Cost of hull and Machinery.
Battleship Kearsarge	368	72-5	23½	11,525	*$2,225,000
" Kentucky	368	72-5	23½	11,525	*2,225,000
" Illinois	368	72-5	23½	11,525	*2,595,000
THE WM. CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.					
Battleship Alabama	368	72-5	23½	11,525	*$2,650,000
Japanese Cruiser Kasagi	374	48	30	4,760	*1,500,000
LEWIS NIXON, CRESCENT SHIP YARD, ELIZABETH, N. J.					
L. H. Tender Mangrove	170	30	16	500	$75,000
BATH IRON WORKS, BATH, ME.					
Composite Light Vessel, No. 71	113	28½	21½	.....	$ 80,000
Torpedo boats Dahlgren & Craven	151	16-8	10	146	*400,000
UNION IRON WORKS, SAN FRANCISCO, CAL.					
Battleship Wisconsin	368	72-5	23½	11,525	*$2,674,950
Torpedo boat Farragut	210	20-4	6	273	*227,500
Japanese Cruiser Chetose	374	48	30	4,760	*1,500,000
COLUMBIAN IRON WORKS, BALTIMORE, MD.					
Torpedo boats Rodgers & Winslow	160	16	5	142	*$195,000
Sub-marine boat Plunger	84	11½	..	168	*150,000
Torpedo boat McKee	101½	12½	4-3	65	*45,000
Revenue Cutter No. 6	190	.....	.....	.....	$ 80,000
HERRESHOFF MFG. CO., BRISTOL, R. I.					
Torpedo boat Morris	147	15½	4½	103	*85,000
Torpedo boats Talbot & Gwinn	100	12½	3½	46½	*78,000
MORAN BROS. CO., SEATTLE, WASH.					
Torpedo boat Rowan	170	17	5½	182	*$160,000
WOLF & ZWICKER, PORTLAND, ORE.					
Torpedo boats Davis & Fox	146	15-3½	5-4	128	*$163,092
Torpedo boat Goldsborough	191	20	5	247	214,500
Light-ship No. 70	112	28½	8	...	73,000
CHAS. HILLMAN SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.					
Torpedo boat Mackenzie	101½	12½	4-3	65	*$48,500
HARLAN & HOLLINGSWORTH CO., WILMINGTON, DEL.					
Torpedo boat Stringham	225	22	6-6	340	$236,000
GAS ENGINE & POWER CO., MORRIS HEIGHTS, NEW YORK.					
Torpedo boat Bailey	205	19-6	...	235	$210,000

*Reported in 1897 and not included in totals, but still under construction.

Lake Ship and Engine Building Notes.

The Racine Boat Mfg. Co., Racine, Wis., is building two steamers for Yukon river service.

Capt. Wm. Duff, Port Clinton, O., is building a schooner with capacity for 18,000 bushels of grain.

The Chase Machine Co., Cleveland, O., have completed six 400-pound pneumatic hammers during the last three months.

The McKinnon Mfg. Co., Bay City, Mich., are building a fire-box marine boiler 4½ by 7½ feet for the tug Tempest.

The Detroit Dry Dock Co., Detroit, Mich., has prepared plans for a 165-foot steamer for Alaskan service, but the contract has not been settled.

Dry Dock Engine Works, Detroit, Mich., has orders for a dozen Howden equipments, some of which include new boilers and a rebuild of engines.

Cylinder sizes of the triple expansion engines building for James Davidson by S. F. Hodge & Co., Detroit, Mich., are 16, 25 and 42 by 36 inches stroke.

Bertram Engine Works Co., Toronto, Ont., will build three steel grain barges for Prescott Elevator Co., Prescott, Ont., in addition to work reported.

Truscott Boat Mfg. Co., St. Joseph, Mich., are building thirty launches, the sizes ranging from 30 to 50 feet. They have made extensive improvements in their plant recently.

Montague Iron Works, Montague, Mich., is building the engines, 14 and 30 by 20 inches, and one 8 by 12-foot marine boiler, for the tug building by E. W. Heath, Benton Harbor, Mich.

There is nothing building at Marine City, Mich., in the Curtis & Brainard, or the Morley yard. The same condition prevails at other St. Clair river yards and also at Algonac.

In addition to the steamer mentioned in the table, the Polson Iron Works Co., Toronto, Ont., are building 185 horse-power engine and boiler for a steamer building in Simpson's yard, Toronto, Ont.

The Marine Iron Works, Clybourn and Southport avenues, Chicago, Ill., are building four stern-wheel steamers, to be shipped to the Pacific coast, and are building engines for several hulls constructed by other parties.

Wickes Bros., E. Saginaw, Mich., are building eight large Scotch boilers. Four are 13 1-3 by 11½ feet, and are to go into the Bessemer steamer building at Wheeler's yard, and four will go into the two Davidson steamers.

It is reported that R. C. Brittain, Saugatuck, Mich., is building a passenger steamer 100 feet over all, 88 feet keel, 18 feet beam and 7 feet deep. The engine is 16 by 16 inches. She will run on the Milwaukee-Saugatuck route.

Vulcan Iron Works, Toledo, O., has contracts for considerable marine repair work. Their specialty is steam-shovels and excavators for mining and railroad purposes. Alex. Backus, the manager, is a young man, but one of the foremost business men of Toledo.

The steel tug which is being completed at Bell's Steam Engine Works, Buffalo, N. Y., is 90 feet over all, 23 feet beam, 14 feet deep; has engines 20, 40 by 30 inches and a 12 by 16-foot boiler, built by the Kingsford Foundry & Machine Works, Oswego, N. Y.

Johnston Bros., Ferrysburg, Mich., are building six marine boilers. One Scotch 11 by 12 feet is for the H. W. Williams and one 6 by 11 feet is for the steamer Glenn. The other four are fire-box boilers, two 7 by 12 feet and two 5½ by 12, feet for different steamers and tugs.

Cleveland Ship Building Co., Cleveland, O., will build the quadruple engines for steamer building by American Steel Barge Co., at West Superior, Wis., which is to have Babcock & Wilcox boilers. This makes three quadruple engines the Cleveland company is building.

In the engine department of F. W. Wheeler & Co., W. Bay City, Mich., there is a 25, 51 by 36-inch compound engine building for one of the Saginaw Bay Towing Co's. tugs. They are also building the largest quadruple expansion engines ever built on the lakes, if not in the United States. The cylinders are 26½, 37, 54½ and 80 by 42 inches stroke.

Coast Ship and Engine Building Notes.

W. C. Shearer, Macon, Ga., is building a small vessel.
George Laird, Beverly, Mass., is building a 30-foot sloop.
A vapor launch is building at Stewart's yard, Wollaston, Mass.
Percy & Small, Bath, Me., will launch a schooner next month.
H. R. Kingman, Lakeside, Wash., will launch a steamer soon.
Albion Iron Works, Victoria, B. C., is building a river steamer.
Herreshoffs, Bristol, R. I., are building a 50-foot racing yacht.
Capt. Gurdon Green, Newport, O., will buld a 150-foot steamer.
Gardner G. Deering, Bath, Me., will build a 1,600-ton schooner.
James & Tarr, Essex, Mass., are building two fishing schooners.
Warford & Robinson, Watervliet, N. Y., will build a $10,000-tug.
Wm. G. Abbott, Milford, Del., will build a 500-ton steam barge.
Capt. Matthews, Aberdeen, Wash., is building a steam schooner.
Stanley Van Sant, Atlantic City, N. J., will build a 58-foot sloop.
In Wyckoff's yard, Clinton, Conn., nine small yachts are building.
Cumberland River Packet Co., Nashville, Tenn., is building a steamer.
Staples Coal Co., Taunton, Mass., will have a towing steamer built.
Cumberland River Packet Co. will build a steamer at Nashville, Tenn.
O. R. Smith, Westerly, R. I., will have a 100-foot passenger steamer built.

Pryor & Clark, No. Weymouth, Mass., are building a 96-foot steam yacht.

Hutton & Gangan will open a ship yard at Point Hudson, Seattle, Wash.

Washburn Bros. & Co., Thomaston, Me., laid keel for 1,200-ton vessel.

Honnes & Nelson, Portland, Ore., are building a 130-foot hull for a dredge.

Dunn & Eliot, Thomaston, Me., will build a 1,000-ton schooner in spring.

Patchogue Steam Ferry Co., Patchogue, L. I., expects to build a steamer.

Coburn Steamboat Co., Greenville, Me., is building a 72-foot steamer.

Capt. Muncy, Bay Shore, N. Y., is building a yacht for G. C. Taylor, Oakdale.

Samuel Pine, Greenpoint, L. I., will build a steam yacht for Thos. L. Watt.

A number of good-sized yachts are building at Hanley's yard, Quincy Point, Mass.

Puget Sound Tug Boat Co., Port Townsend, Wash., will build an $80,000-tug.

Walter Folsom and Eulogis Carrills are building yachts at Santa Monica, Cal.

New Albany (Ind.) Mfg. Co. will build machinery for four Yukon river steamers.

Geo. I. Greenman, Westerly, R. I., is building a small steamer for Hall & Dickinson.

E. J. Howard, Jeffersonville, Ind., has commenced work on four Yukon steamers.

At Bedell's ship yard, Stratford, Conn., there is building a 40-foot oyster gas boat.

A 55-foot steamer will be built at Hunnewell's yard, Brewer, Me., for Capt. Arey.

Wall Bros., Myrtle Point, Ore., will build a 75-foot schooner for Alaskan service.

Theo. A. Crane & Son, Erie Basin, New York, N. Y., are building ten freight scows.

Wm. Gokey & Son, Erie Basin, New York, recently completed a 270-foot floating dock.

Orlando Smith, Pawtucket, Conn., is having a small steamer built at Stonington, Conn.

Elisha Webb, 142 So. Delaware avenue, Philadelphia, Pa., will build a launch for the city.

United States engineer, New Orleans, La., will open bids for a 135-foot tow boat, Jan. 31.

James C. Ollard, Tacoma, Wash., has a contract for three twin-screw Stickeen river steamers.

A. Cary Smith, New York naval architect, will receive estimates on a number of 65-foot yachts.

Madison Machine Co., Madison, Ind., build all the machinery for boats built at the Barmore yard.

Seabury water tube boilers will be used in two yachts building at Morris Heights, New York.

L. F. Gott, Bar Harbor, Me., is building a 22-foot yacht for the president of Harvard College.

The Greenville and Vicksburg Packet Co., Vicksburg, Miss., is building a large passenger steamer.

Tennessee River Navigation Co., Chattanooga, Tenn., will have two new steamers built in the spring.

Supplement to the Marine Review, Cleveland, O., January 20, 1897, Vol. 17, No. 3.

CAPT. JAMES S. DUNHAM, CHICAGO.

PRESIDENT OF THE LAKE CARRIERS' ASSOCIATION.

Lake Carriers Association

A VERY SUCCESSFUL MEETING AT DETROIT — CONNORS IS THE NEW CONTRACTOR FOR GRAIN SHOVELING AT A REDUCTION OF 40 CENTS PER THOUSAND BUSHELS —CHANGES IN SAULT RIVER RULES—A BANQUET THAT WAS GREATLY ENJOYED.

Detroit, Mich., Jan. 20.—W. J. Connors secured the Buffalo grain shoveling contract and nothing whatever was done regarding the proposition to adopt minimum lake freight rates. These were the important announcements at the close of the annual meeting of the Lake Carriers' Association here today. It was the largest and most successful meeting ever held by the association. A bitter contest was waged for the grain shoveling contract, and the vessels get the advantage of a big reduction—40 cents per 1,000 bushels—in the cost of this work, but the question of minimum freight rates was disposed of with the simple announcement from the committee having the matter in charge that it could not be made a subject for consideration by the association. It might be taken up in a separate meeting of vessel owners, the committee said, but there was nobody to lead an outside movement. W. J. Connors secured the grain contract on an even bid of $2.95 per thousand against James Kennidy for the simple reason that he went to Detroit with the necessary tonnage backing. Considerable unpleasantness resulted from the fact that President Dunham had failed to give Buffalo representation on the grain-shoveling committee, but on the bids submitted the result would have been the same no matter how the committee had been made up. It was unfortunate that with the idea preëminent in his mind of having the representatives of big firms on the committee, Capt. Dunham accidentally ignored Buffalo, but it was well known that a majority of the tonnage was pledged to Connors on condition that he should carry out his promise of a big slash in the shoveling charges, and under the circumstances no committee could have changed the result. Some of the Buffalo members remained away from the banquet on account of the committee incident, but there was no one who would charge Capt. Dunham with anything more than an oversight in the matter. It is quite probable that Mr. Kennidy will be engaged by the new contractor to carry on the work in Buffalo next season as in the past. The fight between the two men was very bitter but Connors announced, in a characteristic speech at the conclusion of the meeting, that they had kissed and made up. "I'll make no combine with elevators," he said. "They will come to me now. I am opposed to monopolies unless I am in on the combination. That is the drift of public spirit generally. But whether I deal with the elevators or not, this contract will be carried out to the letter."

VESSEL OWNERS AND OTHERS IN ATTENDANCE.

Cleveland—H. Coulby, L. M. Bowers, Robert R. Rhodes, Geo. P. McKay, H. A. Hawgood, W. A. Hawgood, John F. Wedow, Capt. John Mitchell, Capt. Al. Mitchell, James Corrigan, Mark Hanlon, Capt. Ed. Morton, Capt. Daniel McLeod, John N. Coffin, N. J. Boylan, E. M. Richardson, Capt. John V. Tuttle, Walton McGean, Capt. Charles L. Hutchinson, John A. Donaldson, W. A. Collier, C. C. Canfield, Geo. V. Callahan, A. L. Rumsey, Capt. John W. Moore, Capt. Wm. Gerlach, W. H. Mack, M. A. Bradley, Harvey D. Goulder, P. J. Minch, M. Andrews, Robert Logan, A. B. Conkey, J. H. Bartow, C. E. Benham, John Corrigan, Capt. W. W. Brown, James Wallace, B. L. Pennington, R. L. Newman, Martin Mullen, W. E. Chapman, C. A. Morgan, W. H. Becker, Capt. A. B. Drake, O. J. Pinney, F. W. Jackson, Louis Hausher, Jr., H. A Kelley.

Detroit—Mark Hopkins, James W. Millen, A. A. Parker, Wm. Livingstone, W. A. Livingstone, Capt. Sid. J. Millen, Capt. A. E. Stewart, C. F. Bielman, L. C. Waldo, Horace W. Avery, H. T. Morley, Walter E. Campbell, Henry Wineman, Jr., Capt. J. W. Westcott, D. C. Whitney, Gilbert N. McMillan, T. Hurley, J. W. Walsh, Capt. H. J. Hagan, Capt. J. H. Ivers, C. B. Calder, Capt. Wm. H. Campau, Capt. E. T. Peck, John Pridgeon, Charles Norton, John Stevenson, Geo. Y. Wisner.

Buffalo—J. J. H. Brown, C. H. Keep, Capt. John Hall, P. P. Miller, C. H. Donaldson, James McKenzie, John Green, John Gordon, F. P. Gordon, James Kennidy, W. J. Connor, Michael J. Harter, J. H. Killeran, Junius S. Smith, John Perew, Hamilton J. Mills, C. Lee Abel, Edward Smith, John Johnson, E. C. Maytham, Edward Gaskin, J. L. Crosthwaite, R. E. Rispin, Stewart Murray, Capt. Alex. Clark, Wm. Graham, H. C. Harrison, John Farrell, Capt. Geo. McLeod.

Port Huron—Alvin Neal, Colin McLachlan, Capt. Wm. Forbes, Nelson Mills, Geo. Lynn, Capt. Andrew Gaines, Capt. Wm. H. Hutcheson, Capt. David A. Hutcheson, Capt. W. E. Rice, Capt. Thomas Currie, Capt. John Little, Capt. John H. Bradshaw, Capt. Arthur May, Capt. George Pierce, Capt. Frank H. Danger, Capt. Edward J. Kendall, H. E. Runnels, Capt. A. A. Cox, M. J. Madden, Capt. J. Cornwall, Capt. Charles Black, A. G. Carpenter, Capt. W. W. Stewart, Capt. W. J. Montgomery, Capt. J. Canally, D N. Runnels, Capt. W. D. Ragan, J. A. Sinclair, F. P. Fitzgerald, Capt. C. C. Balfour.

Chicago—Capt. J. S. Dunham, H. F. J. Porter, J. J. Rardon, W. J. Rardon, Capt. Denis Sullivan, C. W. Elphicke, Capt. James H. Calbick, C. A. Macdonald, W. I. Babcock, C. E. Kremer, D. T. Helm, G. H. Sinclair, Miles Barry, Capt. Peter Barry, Thomas Prindeville, T. T. Morford, G. G. Tunell, J. Sinclair.

Bay City—W. C. Penoyer, W. V. Penoyer, C. A. Eddy, Capt. Howard L. Shaw, Capt. Ben. Boutell, Samuel P. Cranage, F. W. Wheeler, Capt. James Davidson, James E. Davidson, Chesley Wheeler, O. W. Blodgett, Mr. Moulthrop, S. Anderson, J. Bennett.

Algonac—Angus Smith, Capt. C. B. Galton, Capt. Chas. H. Marsden, Capt. C. E. Marsden, Capt. E. Rathburn, Capt. Arthur Little, Capt. T. Skinner, Capt. B. D. Townsend, Capt. H. H. Townsend, Capt. R. Jackson, Capt. James Stewart, Capt. Fred. Galton, Capt. Nelson Little.

Marine City—Capt. C. T. Morley, Capt. John Jenkins, Capt. C. E. Norton, Capt. W. Smith, Capt. J. A. Ward, Capt. George Case, Capt. Thos. S. Lester, Capt. Wm. Crowley, Capt. Wm. Shorkey, G. W. Parker, Capt. M. P. Scott.

Duluth—Capt. Alex. McDougall, A. B. Wolvin, Capt. Alex. R. Sinclair, C. A. Sinclair, B. B. Inman, G. A. Tomlinson, W. H. Singer, Capt. C. H. Weeks, H. B. Earhart

St. Clair—Simon Langell, Capt. W. C. Brown, Capt. W. B. McGregor, Chas. Beyschlag, Capt. E. B. McQueen, Capt. Richard O'Connor, Capt. C. H. Westcott, E. C. Recor, Capt. H. Fish, Capt. M. P. Parsons, Capt. C. C. Balfour, Capt. H. Robertson.

Milwaukee—W. E. Fitzgerald, Capt. A. B. Davis, Capt. H. Leisk, W. H. Meyer, Thomas Sheriffs, David Vance.

Amherstburg—John Mullen, Capt. Andrew Hackett, Capt. David Gerardin, Capt. Duncan Nicholson, Capt. J. Laframboise, Capt. H. G. Duff, Capt. J. T. Hutton.

Toledo—T. J. Southard, W. S. Brainard, John Craig, L. S. Sullivan, J. P. Nagle.

From various ports—W. J. Symons, Fairport; J. P. Devney, Ashtabula; N. Mills, Marysville; W. S. Brainard, Toledo; Capt. Wm. H. Rools, Romeo, Mich.; H. L. Holden, Two Harbors; Gurdon Corning and Capt. J. C. Garry, H. W. Hubbell, Saginaw; Capt. Sid Scott, Wm. Flumer, Wm. Dulac, W. J. Lynn and Capt. C. E. Little, of Mt. Clemens; F. W. Gilchrist, Alpena.

ANNUAL REPORTS—NEW OFFICERS.

As usual, the first business at the opening session was the reading of the annual report of the board of managers. This report, which is prepared by Secretary C. H. Keep, and which is always a most valuable document, on account of the care that is taken to make it each year a complete summary of the affairs of the association, is printed in full on pages that follow. It will bear a second reading by everybody interested in lake shipping. The report of Capt. Geo. P. McKay, treasurer, was also read by Mr. Keep and will be printed in our next issue. Expenditures aggregated about $20,000, and the association is in debt about $3,000, but the unpaid liabilities are balances on salaries of officers that were really carried over from last year. Immediately following the reading of these reports, Capt. James Millen, the retiring president, called for nominations for new officers. According to the general understanding, the name of Capt. James S. Dunham of Chicago was the only name presented. Mr. Wm. Livingstone said in nominating Capt. Dunham that there would be no orphans in the association during the coming year, as Capt. Dunham would father them all, and no widows, as he would marry them all. But to be serious, he was one of the most indefatigable workers in the organization. He spared neither time nor money in his efforts to promote shipping interests. Capt. Dunham was unanimously elected by a rising vote, after the nomination had been supported by Mr. C. W. Elphicke from his own city and Mr. B. L. Pennington of Cleveland.

"Everything comes to him who waits," said Capt. Dunham, as he ascended the platform, "and this is an honor worth waiting for. I am honest in saying to you that I have for several years thought of the great happiness that would follow my election to this place. Today is the proudest day of my life." Capt. Dunham added other expressions of appreciation of the honor bestowed upon him. Capt. James Davidson suggested a vote of thanks for the retiring president, Capt. James Millen, and it was adopted with great earnestness. Then a nominating committee, consisting of C. W. Elphicke, David Vance, A. B. Wolvin, James Davidson, L. C. Waldo, James Corrigan and J. J. H. Brown, presented a revised list of vice-presidents and standing committees. After two or three names had been added the report was adopted, and Messrs. Keep, McKay and Goulder were re-elected respectively to the positions of secretary, treasurer and counsel, so that the full list of new officers is as follows:

President—James S. Dunham.

Vice-presidents—H. A. Hawgood, Cleveland; David Vance, Milwaukee; C. W. Elphicke, Chicago; A. A. Parker, Detroit; G. L. Douglass, Buffalo; G. A. Tomlinson, Duluth; Chas. A. Eddy, Bay City; F. J. Firth, Philadelphia; Leander Burdick, Toledo; M. J. Cummings, Oswego; Alvin Neal, Port Huron; James McBrier, Erie; J. H. Westbrook, Ogdensburg; F. W. Gilchrist, Alpena; G. E. Tener, Fairport.

Secretary—C. H. Keep, Buffalo.

Treasurer—George P. McKay, Cleveland.

Counsel—Harvey D. Goulder, Cleveland.

Board of Managers—E. Gaskin, Peter P. Miller, E. T. Evans, G. L. Douglas, Charles Paine, J. J. H. Brown, John Kelderhouse, W. H. Gratwick, M. M. Drake, W. P. Henry, Edward Smith, W. C. Farrington, H. C. French, C. H. Donaldson and James McKenzie of Buffalo; Thomas Wilson, M. A. Bradley, James Corrigan, H. M. Hanna, Geo. P. McKay, H. G. Dalton, Harvey H. Brown, John W. Moore, B. L. Pennington, John Corrigan, Wm. Gerlach, Henry A. Hawgood, W. C. Richardson, J. C. Gilchrist, W. D. Rees, John Mitchell, R. R. Rhodes, Caleb E. Gowan, L. M. Bowers, W. H. Becker, W. A. Hawgood, W. H. Mack, and C. E. Benham, of Cleveland; James W. Millen, William Livingstone, Jr., David Carter, D. C. Whitney, W. A. Livingstone, A. A. Parker, L. C. Waldo and J. W. Westcott of Detroit; D. T. Helm, Jesse Spaulding, J. S. Dunham, John Keith, Joseph Austrian, W. R. Owen, C. W. Elphicke, Wiley M. Eagan, J. J. Rardon, J. H. Channon and James H. Calbick of Chicago; Leander Burdick, W. S. Brainard, A. W. Colton and L. S. Sullivan of Toledo; James Davidson, Charles A. Eddy, O. W. Blodgett, F. W. Wheeler, B. Boutell, Thomas Cranage, Howard L. Shaw and J. W. McGraw of Bay City; Alex. McDougall, F. N. LaSalle, G. A. Tomlinson and A. B. Wolvin of Duluth; David Vance, R. P. Fitzgerald, H. J. Pauly, W. H. Wolf and W. H. Meyer of Milwaukee; James McBrier and Geo. Berriman of Erie; F. W. Gilchrist of Alpena; Alvin Neal of Port Huron; C. T. Morley of Marine City; R. E. Schuck of Sandusky; Frank J. Firth of Philadelphia; J. H. Westbrook of Ogdensburg; G. E. Tener, Fairport.

Executive Committee—James Corrigan, H. A. Hawgood, Thomas Wilson, M. A. Bradley, L. M. Bowers, H. G. Dalton, W. C. Richardson,

B. L. Pennington, Wm. Gerlach, Cleveland; L. C. Waldo, D. C. Whitney, Detroit; W. P. Henry, J. J. H. Brown, Buffalo; R. P. Fitzgerald, Milwaukee; C. W. Elphicke, Chicago.

Committee on Aids to Navigation—Geo. P. McKay, W. H. Becker, John W. Moore, W. A. Hawgood, Thos. Wilson, C. E. Benham, H. Coulby, Cleveland; J. G. Keith, W. M. Egan, Chicago; W. A. Livingstone, Detroit; J. H. Westbrook, Ogdensburg; A. W. Colton, Toledo; James Davidson, West Bay City; Alvin Neal, Port Huron; M. M. Drake, Buffalo; W. W. Smith, Sault Ste. Marie.

Committee on Legislation—G. L. Douglas, E. T. Evans, P. P. Miller, H. C. French, Charles Paine, Edward Smith, Buffalo; L. C. Hanna, James Corrigan, Cleveland; Wm. Livingstone, Detroit; C. A. Eddy, Bay City; Alex. McDougall, West Superior; F. J. Firth, Philadelphia; James E. Davidson, West Bay City; Denis Sullivan, Chicago, and W. E. Fitzgerald, Milwaukee.

TONNAGE DUES—IMPORTANT COMMITTEES.

Upon completing the list of officers the question of tonnage dues was readily disposed of. The association had reduced a part of its indebtedness during the year, but any thought of a reduction in dues was, of course, out of the question, as there had been no extraordinary expenses in 1897 and there was still an indebtedness of about $3,000. Mr. James Corrigan of Cleveland was in favor of a slight increase in dues, but it was decided, after a short discussion, to make them the same as in 1897—3 cents per net registered ton for vessels of 1,200 tons and over, and 2 cents per ton for all vessels under 1,200 tons.

When it was proposed to take up the appointment of committees that were to consider various questions coming before the convention, it was evident that the Buffalo grain shoveling question would be given most attention. Probably a dozen representatives of large fleets of vessels, including Edward Smith of Buffalo, James Corrigan, James Davidson, James E. Davidson, Wm. Livingstone and H. Coulby, addressed the meeting in support of a motion to follow the custom of previous years and refer the subject to a committee, with the understanding that the committee should deal with the several bidders and report its findings to the general organization. This plan was agreed upon and President Dunham announced the following as members of the committee: James E. Davidson of West Bay City; A. B. Wolvin of Duiuth; David Vance of Milwaukee; C. W. Elphicke of Chicago; James Millen of Detroit; James Corrigan, L. M. Bowers, H. A. Hawgood and H. Coulby of Cleveland. Other committees were as follows: On proposed changes in Sault river navigation rules—H. Coulby, Geo. P. McKay, James Millen, Alex. McDougall and Capt. Ed. Morton. On salaries of officers—James Millen, James Corrigan, H. A. Hawgood, A. B. Wolvin and J. J. H. Brown. On elevating and grain shoveling at Lake Ontario ports—James Davidson, J. H. Calbick and E. C. Recor. All of these committees, excepting the Sault river rules committee, which reported and was discharged, still have work in hand and will be expected to deal with the executive officers of the association at meetings that will be arranged in the future. As shown by a report elsewhere pertaining to the outcome of the grain-shoveling contest, the committee having that matter in hand will be expected to arrange the details of the contract with Mr. Connors and to take up with him any questions that may arise regarding the work. There was also referred to this committee, for settlement before the opening of navigation, several communications regarding the trimming of grain at Duluth and Port Arthur. At the latter port, vessels are forced to pay for trimming, whether the ship masters deem it necessary to trim or not. This rule at Port Arthur will be considered and an effort made to bring about a modification of it, as it is claimed that with some vessels unnecessary expense is levied on this account. The committee that was entrusted with the duty of trying to secure a reduction generally in elevator charges at Ogdensburg and other Lake Ontario ports, will find it necessary to take up the subject by correspondence and report as soon as possible to executive officials of the association.

On the question of salaries of officers the report submitted was to the effect that the subject could be handled more advantageously by the executive committee of the association. Mr. C. H. Keep, secretary of the association, has said that his duties of late have not been as extensive as in the past, and he would probably agree to a reduction in salary, but his ability in the line of work in which he has been engaged is appreciated by those who have had the reins in hand, and if a reduction is made in his case, or in the case of any of the officers in fact, it will be done in such a way as to not interfere with the harmonious relations that have existed among the several active officers.

Other committees whose duties are still in hand will take up the question of a uniform bill of lading and also the matter of charges on trimming and unloading ore. The ore charges will be considered by B. L. Pennington, M. A. Bradley, E. C. Maytham, W. H. Mack, John Corrigan, Capt. C. E. Benham and Edward Smith. These gentlemen will endeavor to make in the spring the best possible arrangements with the ore dock managers at Lake Erie ports and with the ore trimmers at upper lake ports.

The committee entrusted with the labor of framing a uniform bill of lading has important work in hand. This problem has been discussed many times by vessel owners in meeting but no determined effort has ever been made to solve it. Members of this committee are Messrs. Donaldson and Keep of Buffalo, Wolvin of Duluth, Elphicke of Chicago and H. A. Hawgood of Cleveland. Managers of several of the leading fleets of vessels on the lakes are in earnest regarding a reform in this feature of the grain trade. It is not proposed, as Mr. Goulder said, to arbitrarily insist upon a bill of lading made up by vessel owners, but on the other hand an effort will be made to confer with shippers, consignees and bankers in trying to remove practices in the grain trade which are detrimental to vessel interests. Capt. J. J. H. Brown of Buffalo was named as chairman of this committee, but he asked to be excused and suggested the appointment of Mr. Donaldson of Buffalo in his stead, as he is going south and expects to be away from Buffalo for several weeks.

TO MODIFY ST. MARY'S RIVER RULES.

As a result of a thorough trial of rules governing the navigation of St. Mary's river, it has been agreed for some time past that the speed limit of 7 miles an hour in certain parts of the river was restricting most vessels to a degree beyond what was demanded for safety. The revenue cutter officials in charge of the river patrol agreed with the vessel owners and vessel masters in this regard, and when Capt. A. B. Davis, representing the treasury department, appeared at convention and gave his views on the subject, it was evident that there would not be much difficulty in agreeing upon a modification of the rules. Capt. Davis was very kindly received and expressed appreciation of the honor that was accorded him. He was asked to consult with the committee that had been appointed to consider the rules and did so with the resuit that the committee, through its chairman, Mr. H. Coulby of Cleveland, submitted a report increasing the speed to 9 miles an hour and making a few other less important changes. The treasury department, appeared at the convention and gave his views on the report of the committee was adopted, and it is more than probable that the in the rules accordingly. Following is the report:

"Your committee congratulates the association on the success of the Sault river rules promulgated by the secretary of the treasury. The rules were adopted during the progress of improvements and were in a sense experimental. The improvements have been so far completed that your committee, kindly aided by Capt. A. B. Davis of the revenue cutter service, believes that the rules may now safely be amended by the increase of speed and in the direction of some further liberty of passing vessels in the river, and we submit the following amendments and recommend their submission to the secretary of the treasury, through Capt. A. B. Davis, with the approval of this association, and request that if approved by the department they be put in force; and this association extends its sincere thanks to the secretary of the treasury for detailing Capt. Davis to the duty of enforcing the rules, and to Capt. Davis for his efficient, conservative and wise administration of the rules:

"Amend rule I to read: No vessel ascending or descending shall proceed at a greater speed than nine statute miles an hour over the ground between the following named points: Between the turning channel buoy in the northern part of Mud lake and the northern float lights of the 20-foot channel in Hay lake leading from the Neebish channel; between the crib light at the southern entrance of the upper 20-foot and Little Rapids channels and the government pier at Sault Ste. Marie; and between the western piers and Points Aux Pins. No vessel shall approach another vessel moving in the same direction nearer than one-quarter of a statute mile between the points named in Rule 1, excepting the following points and in places where a vessel is allowed to pass another vessel moving in the same direction: Turning channel buoy in Mud lake and Everens point; between the northern end of the Dark Hole and black buoy number 29 in Little Mud lake; and between the crib light at the northern entrance of Little Rapids cut and the government pier at Sault Ste. Marie. In passing the above permissible points no vessel shall increase the speed over nine miles an hour."

"Amend rule 1V by striking out in the fourth line from the bottom the words at no nearer distance than 500 feet, and in place thereof insert the following: 'Any vessel in passing another vessel must not crowd upon the vessel being passed.'"

POE MEMORIAL—MISCELLANEOUS MATTERS.

At the banquet, Wednesday evening, Mr. Wm. Livingstone had made an eloquent plea in support of the proposition to erect a memorial to the late Gen. O. M. Poe at Sault Ste. Marie. The idea is not to attempt anything on a grand scale, but Mr. Livingstone and others of the association are determined that it shall not be said that the vessel owners did nothing to perpetuate the memory of one of the staunchest friends of lake shipping interests. In accordance with his remarks at the banquet. Mr. Livingstone introduced on Thursday a resolution providing for the appointment of a committee of one member from each of the leading ports of the lakes, to again take this matter in hand and secure subscriptions. It is certain that from one source known to Mr. Livingstone $1,500 can be secured. The committee appointed for this purpose is as follows: Mr. Livingstone, Detroit; C. H. Keep, Buffalo; J. S. Dunham, Chicago; H. H. Brown, Cleveland; H. D. Goulder, Cleveland; David Vance, Milwaukee; A B. Wolvin, Duluth; C. A. Eddy, Bay City; J. H. Westbrook, Ogdensburg.

A communication from the National Board of Steam Navigation, which is an organization made up largely of western river steamboat owners, asked the lake carriers to use their influence in support of a measure that aims to overcome the annoyance of vessels being libeled for small claims. These claims are often unjust but are sometimes paid rather than go into court with them and incur expenses in excess of the claims themselves. This is an old question that has been several times brought up in the association, but it would seem that Mr. Hunter's bill, now before congress, will, with a few minor alterations, overcome the trouble. The necessary alterations are in details that might make the measure impracticable, but it is quite certain that changes can be made through correspondence with the author of the bill and the river steamboat owners. Mr. Goulder, counsel of the association, was authorized to recommend passage of the bill in the name of the lake vessel owners when these changes are made. If this bill is passed, the vessel owners of the lakes may file bonds in any of the eight judicial districts in this vicinity where their vessels may be trading, and there would then be no delay in event of a vessel being libeled. Acting on a suggestion presented by this bill, a representative of the National Surety Co. from Buffalo addressed the vessel owners on the subject of bonds of this kind. He said that his company offered special arrangements for providing such bonds and would be pleased to take up the subject with any of the vessel owners. Mr. F. P. Gordon of Buffalo represents the National Surety Co. on the lakes, and it is understood that he provided bonds for the several parties who were bidding on the Buffalo grain shoveling contract.

During the first session of the convention Mr. W. I. Babcock of the Chicago Ship Building Co. asked a question that settled a point regarding membership in the association. As manager of the Chicago Ship Building Co., he represented several interests in vessel property, but was not a managing owner in any case, and therefore made inquiry as to whether he was a member. Mr. Goulder answered that he was a member without doubt, entitled to all the privileges of the floor, but the association had never been brought face to face with the question as to whether in voting according to tonnage, which is a rule of the by-laws when an important

point is to be determined on a close vote, the managing owner would be entitled to vote the full tonnage of a ship or divide it with his associate owners who might demand such division. Mr. Goulder hoped that an extreme case of this kind would never be encountered in affairs of the organization, but other members were of the opinion that the question should be settled anyhow, and on motion of Mr. A. B. Wolvin of Duluth a resolution was passed declaring that the managing owner should vote fully the tonnage of the vessel or vessels which he represents.

On behalf of the Goodrich Transportation Co., Congressman E. S. Minor and numerous vessel masters and vessel owners of Green Bay, Wis., Capt. M. M. Drake of Buffalo presented for the consideration of the association a petition to congress asking for three gas buoys, to indicate the channel from Green bay into the city of Green Bay. It is proposed to place one of these buoys at Long Tail point, to mark the entrance of the new channel from Green bay; another at the elbow about half-way between Grassy island light and Murphy & Co.'s mill, and the third at the Murphy mill where Green bay and Fox river meet. The correspondence was referred to the committee on aids to navigation, of which Capt. Geo. P. McKay of Cleveland is chairman.

A letter from the Ogdensburg Transit Co. directed attention to a series of resolutions pertaining to lights, fog signals, gas buoys, etc., adopted by vessel owners and vessel masters trading to Lake Ontario and points down the St. Lawrence river. The resolutions advocated the establishment of several aids to navigation that are very much needed in order to assist the lower-lake commerce. These resolutions have already been published in the Marine Review. They were also referred to the committee on aids to navigation and will receive the attention of that committee in its dealings with the present congress.

Capt. C. E. Benham of Cleveland said that he had heard of an effort in some quarters to change the White law. He was certain that the law was eminently satisfactory to the great majority of ship masters, and a resolution was adopted declaring that it is the sense of the association that no change be made in the navigation rules known as the White law, under which lake vessels are now operated.

Capt. James Millen of Detroit secured the adoption of a resolution endorsing the improvement of the Erie canal as a measure tending to increase lake commerce.

Just before adjournment A. L. Rumsey was elected sergeant-at-arms, to serve at the next annual meeting, and upon being called upon for a speech, made a few remarks in a creditable manner.

ALL ABOUT STEEL FORGINGS.

The address on "Steel Forgings for Marine Engines," by H. F. J. Porter of the Bethlehem Iron Co., which had been announced to take place Wednesday evening, was given at 5 o'clock in the afternoon of that day, owing to the banquet. The address was illustrated by lantern slides showing sections of broken shafts of the size used in lake vessels and making it evident that the breaks were caused by incorrect methods of manufacture. Comparisons in strength were made between wrought iron and steel, showing the inherent weakness of wrought iron, due to slag and other impurities, and the superior strength of steel, owing to the absence of these impurities. Mr. Porter reviewed the history of the iron and steel industry in this country, showing how up to twenty years ago wrought iron was universally used for all purposes. Since then, however, a gradual change has taken place, and now wrought iron is becoming less and less used in the trades. This change has come about from the demand for a stronger and more reliable material than wrought iron to meet the requirements of the trades which daily call for larger machines and more severe service. Mr. Porter said that when our government decided to build a new navy it was confronted with the fact that there was no forge in this country adequately equipped to furnish forgings for guns, armor-plate and marine engine parts. The Bethlehem company at this time arranged to step into the breach and erected its present plant at South Bethlehem, Pa. This plant when built duplicated the forges of Whitworth & Co. of Manchester, England, and Schneider & Co. of Le Creusot, France, which stood at the front of all the forges in Europe at the time. Since then this company has added tools and equipment, in order to be prepared to meet all demands that might be made upon it. As an evidence of their enterprise Mr. Porter mentioned the fact that although they had built the largest hammer in the world, having 125 tons falling weight, they have discarded its use altogether and replaced it by presses of various sizes from 2,000 tons to 14,000 tons capacity.

Mr. Porter's illustrations showed the various processes now considered best practice in making steel forgings, and showed representative forgings made for well-known marine engines. These processes are fully described in the Marine Review of Jan. 19, 1897.

The Bethlehem Iron Co. makes the marine engine forgings for the navy, such forgings being generally made hollow. This type of forging is being gradually adopted by ocean-going vessels, and it is of interest to note that the first vessel on the lakes to adopt this type of shaft, now being built for the Bessemer Steamship Co. by F. W. Wheeler & Co. of W. Bay City, has been named John Fritz, after the "father of the iron and steel industry in this country," who was for many years the superintendent of the Bethlehem Iron Co., and to whom the country is indebted for the present possibility of obtaining this character of work without having to go to Europe for it. Steel forgings only are turned out at this plant, which is the largest in the United States and the most complete in the world.

Capt. Edward C. Gatfield, whose death was announced from Amhertsburg on Thursday last, was well known and highly esteemed among lake vessel men. He was one of a large number of men of splendid physique that are to be found among ship masters of the lakes, and on the day of his death was preparing to go to Detroit to look after repairs that are to be made to the steamer Harvey H. Brown during the winter. Heart failure was the cause of death.

Capt. Gatfield was in his fifty-second year and had followed the lakes since he was fourteen years of age. He was one of the old line of river tug captains who were all successful steamboat men. The tug Niagara was his first command and he was in charge of river tugs for fourteen years. He had been with the North Western Transportation Co. of Detroit and Cleveland since 1887, commanding the freight steamers Forest City and Harvey H. Brown.

THE DUNHAM BANQUET.

A DECIDEDLY AGREEABLE AFFAIR—AN IDEAL TOASTMASTER AND A BIG ROOM FULL OF FUNNY STORY TELLERS—JUST ENOUGH EARNEST TALK.

The initial banquet of the association, given at the Hotel Cadillac on Wednesday evening, was a decided success—so much so that there was little doubt of some means being provided for banquets at all future meetings. Capt. Dunham, the newly-elected president, was congratulated on all hands, but insisted that those who had helped him with the affair, especially Capt. John Mitchell and Mr. Wm. Livingstone, should share in the honors. Decorations were all of a marine kind, and the menu card was especially appropriate. It was bound in canvas, tied by cord of the kind used in sail lofts and embellished with marine designs, the first page containing a large engraving of a modern lake steamer. Harvey D. Goulder has won compliments as a toast-master in other social gatherings. Among the vessel men of the lakes, who have known him from boyhood, he was decidedly at home. But he kept within the province of a toastmaster. He allowed others to talk. In opening the festivities he made grave reference to thoughts of the oldfaces that are gone; thoughts of strength and virility represented in the Lake Carriers' association. "Instead of strength and virility," he added, "I can think of nothing as I glance over this gathering but youth and beauty." This was an opening for Mayor W. C. Maybury of Detroit to address a few good-natured but very amusing remarks to Mr. Wm. Livingstone in connection with the thought of youth and beauty. "Mr. Livingstone had left associations of youth and beauty among vessel owners," he said, "to undertake the disreputable business of publishing a newspaper." Mayor Maybury's talk, after extending a warm greeting to the vessel men, was of a very pleasing kind. He told several good stories, all of them indicating associations with the vessel men of Detroit. The lake marine of today is of marvelous growth. He had watched it since he was a boy in Detroit, when the old high-pressure side-wheeler Oneida passing up and down the river was a great steamer. She had a small boiler and a large whistle. When she whistled she stopped. But to be serious there was one grand thought about lake commerce. It is the only real American commerce today under the stars and stripes. Mr. Maybury remembered Capt. Joe Nicholson in a few kind words and the health of that venerable ship builder and ship owner was drunk by the company. President Dunham and the retiring president, Capt. James Millen, made short addresses, and two other ex-presidents, Messrs. Brown and Livingstone, indulged in an amusing parley pertaining to relations between ship broker and ship owner. When it was at an end Mr. Livingstone took occasion to remind the vessel owners that nothing had been done toward a memorial at the Sault for the late Gen. Poe. "We have a great deal to be thankful for," he said. "This year has passed without a single death in our ranks. Friendships of the closest and warmest kind are formed among vessel men. An appeal to you in behalf of the memory of one of your best friends will be heard. One of the best friends the Lake Carriers' Association ever had was Gen. O. M. Poe. A man of integrity unassailable, we owe a tribute to his memory. Living in Detroit as I have, and knowing Gen. Poe as I did, I say it is utterly impossible to figure in dollars and cents the great benefits that he rendered to lake navigation. Great influences were brought around him on questions like that of the Detroit river bridge, but he was like a granite rock when he declared that the interests of the lakes demanded a certain course; he knew nis duty and he proposed to do it. I have been taunted with the thought that not one single tribute has been paid to the memory of this great friend of the vessel men." Mr. Livingstone announced that at the next session of the convention he would propose the appointment of a committee to provide for a Poe memorial of some kind at Sault Ste. Marie. He did so, and as chairman of the committee he will soon have vessel men of influence working with him in all of the leading lake cities.

In responding to the toast "Some Risks we Take," C. A. Macdonald, insurance agent of Chicago, told of some of the peculiarities of vessel men from different lake cities who go to Chicago. There was the West Bay City ship builder and ship owner who is very deaf when he doesn't care to hear what is being said but can hear a whisper on other occasions, and the Cleveland vessel owner who comes to town in the morning, insists upon three days' work being done in one and makes you stay down town and accompany him to the train at 11:30 at night. There was also the Detroit vessel owner, but he caused little trouble as he usually wound up in the lock-up. But now that Capt. James Dunham had been elected president of the Lake Carriers' Association he was going to stop bailing vessel owners out when they go to Chicago, unless at tug prices—$25 for the first hour, etc. But to be serious, and without attempting to advertise his business, if there was anybody in the room who wanted insurance against the consequences of contact with any other drink than water he could step up and get it.

Capt. Dunham has said that as president of the association he will encourage young men by urging them to the front as much as possible. He began by inviting James E. Davidson, son of the wealthy West Bay City ship builder, to respond to a toast at the banquet. Among those who know him well the younger James Davidson is said to possess many of the hard, common sense, business qualifications of his father. He is also capable of delivering a very interesting address, and in good style. If his response to a toast at the banquet was a maiden effort he is to be congratulated. He surprised his friends, although not all of them will agree with him in his opinion of 3,000-ton ships as against the 6,000-ton crafts.

QUESTION OF 500-FOOT SHIPS.

"The question of 500-foot ships," said Mr. Davidson, "is one of the gravest problems which confronts the lake interest today. It is thought to be gravest because upon its solution rests a revolution in lake commerce and a practical disqualification on more than nine-tenths of our present tonnage. We who are actively engaged in lake transportation are, as a rule, a moody class. When the times are prosperous and freights are booming we soar high, but when general business is dull and rates are low we are correspondingly depressed. Let us not pass judgment too hastily upon the proposition that the 3,000-ton ship has outlived its usefulness, and will soon pass out of existence. Both for convenience and

Lake Superior Iron Ore Shipments (Gross Tons) for 1897 and the Past Forty-two Years.

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NAME OF MINE.	Prior to 1881.	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	TOTALS.
Marquette Range.																			
American (Sterl'g)	797	4,702	8,006	3,618	2,916			1,483	13,699	20,032	21,000	21,604	15,076						112,933
Ames														1,103	5,195				6,298
Barnum (B)	460,428	27,883	41,778	62,732	69,408	47,458	52,975	16,123	10,211	12,835									801,851
Bay State	14,187	583	1,236	621															16,637
Bessie												847							847
Beauford			5,532	18,976	18,360	17,166	17,354	12,829											90,217
Blue														13,809	32,171	44,140		2,519	92,639
Boston	6,478	14,824	18,245	20,190	2,218												587		62,542
Buffalo (A)							10,860	24,686	30,801	50,919	100,464								217,730
Braastad { Mitch'l	54,567	21,146	33,396				7,017	16,419	4,091										136,636
Braastad { Wint'p.	212,670	43,639	23,005	50,143	73,144	53,913	58,743	74,067	86,789	155,341									831,445
Cambria	36,458	19,246	64,545	47,508	59,742	50,796	58,784	41,130	57,861	72,780	80,359	34,662	41,549	30,445	47,218	41,656	95,086	110,648	990,473
Champion	830,480	145,427	159,009	104,960	210,180	173,915	137,593	146,330	174,680	215,008	223,442	133,413	109,979	61,648	42,788	100,398	113,375	141,728	3,224,443
Cheshire (Swanzey)	79,730	15,011	31,498	13,730	3,557		8,328	2,842				7,301	29,403	19,096		6,593			217,089
Chicago	3,364	5,531		117															9,012
Clev'd-Cliffs I. Co.	2,226,510	198,569	206,120	218,219	225,674	218,757	203,664	207,441	184,316	274,048	331,713	221,788	310,907	218,105	143,706	221,153	513,119	718,408	6,842,217
Columbia (Klom'n)	70,875	11,158	12,066	714															94,813
Curry										16,671									16,671
Detroit			5,402	12,314	3,809	19,125	39,400	26,099	18,500	10,112	6,080								140,841
Dexter				4,878	16,202	750			1,821	3,895	9,136	5,448	13,000	7,833	21,740	13,752	18,903	1,154	118,512
Dey					2,709														2,709
East Champion	60,856	3,408	4,002	5,639						2,097									76,002
East New York									13,694	29,739	36,431	50,293	35,175	911					166,243
Edison										893									893
Erie			2,731	5,405															8,136
Etna				1,091															1,091
Fitch											16,550	15,093				174			31,817
Foster (B)	105,938	3,011	11,648	10,029	9,675	9,643					21,949								171,893
Gibson						1,515	12,142	2,700											16,357
Goodrich	29,511	10,245	9,998																49,754
G'd Rapids (Davis)								1,200	11,611	20,058	26,426	9,362	22,823	352	12,073	6,764	67		110,736
Harford										566			5,678	6,513			1,532		14,289
Hortense (N.Ch'p'n)								886	5,685	7,757	16,246								30,574
Humbolt	469,194	26,302	43,463	31,866	23,763	11,766	20,207	19,873	11,655	15,866	23,259	19,879	4,571				2,297		723,961
Iron Cliffs (K)								87,346	78,520	134,616	188,776	278,270	289,395	130,812	253,760	259,042			1,700,537
Imperial											38,460	18,552	7,194						64,206
Iron Mountain								393											393
Jackson	2,076,223	118,939	96,830	71,278	83,251	68,657	89,370	109,906	101,909	128,891	124,682	92,979	92,567	51,009	32,298	42,186	80,710	79,102	3,540,787
Lake Superior	2,434,221	262,235	296,509	200,799	204,796	226,040	267,622	302,909	240,225	288,784	318,321	308,831	366,715	329,610	344,758	342,439	459,576	376,761	7,571,151
Lillie	65,305	16,748	27,494	4,614	2,683	708	3,957	23,041	32,692	33,916	31,812	19,551	29,005	68,861	78,388	54,285	107,532	112,781	713,373
Lucy (McComber)	224,294	28,051	40,406	14,676				12,139	22,276	32,982	43,483	27,683	26,326	21,964				10,033	504,313
Manganese				397	1,484	3,111	1,367												6,359
Marquette (C)							5,229	20,441	7,060	70,128	23,692	16,802	9,555						152,907
Mesabi's Friend																5,503	10,540		16,043
Michigamme	385,975	57,272	43,712	42,533	25,935	12,373	48,790	58,726	36,448	56,999	80,777	23,169	1,894	935	1,610	3,214			880,362
Milwaukee	14,083	31,635	40,891	805	25,991	38,465	46,693	50,490	48,908	52,727	24,763								375,451
National	66,852	24,833	23,366	21,178	13,987														150,216
Negaunee								5,259	45,304	78,318	76,488	64,218	85,846	69,732	132,581	90,682	175,394	182,169	1,005,991
" Con. Wks.			1,177	10,394	43		1,094												12,708
New York (York)	924,927	50,074	56,806	1,517	1,677			5,128		12,844	2,422		11,220	25,000	21,487				1,113,102
N. Y. Hematite	35,482		2,105																37,587
North Republic									289										289
Northwest													1,687						1,687
Norwood								2,200	3,553										5,753
Nonpareil (St.Law.)			9,998	11,961				1,436											23,395
Ogden																		986	986
Palmer																	1,041		1,041
Pascoe			18,880		12,605	18,249	10,072												59,806
Pendill	20,508	13,586	9,987	318	1,594														45,993
Phenix (Dalliba)		10,986	44,836	1,687				1,605											59,114
Pioneer							5,140	1,203	9,066										15,409
Pitts. & L. Angel'e.	507,637	18,060	14,326	27,259	86,922	111,051	131,731	191,120	223,600	229,670	261,681	241,605	287,517	351,973	355,453	313,555	342,251	489,685	4,184,496
Platt													2,676	5,448	41,226	13,198	11,296		73,844
Primrose																	6,040		6,040
Prince of Wales (A)											32,415								32,415
Quartz										491									491
Queen (A)									5,527	66,122	109,217								180,866
Queen Ir. M'g Co. (F)												479,509	379,719	106,864	220,298	160,817	323,057	239,774	1,910,038
Republic	1,193,613	233,786	235,109	152,565	277,757	250,835	241,161	220,624	235,062	287,390	220,065	191,127	167,991	64,195	105,719	174,027	127,360	124,342	4,502,728
Repub. Reduc. Co.								87	21,050	22,122	3,915								47,174
Richards								1,374										6,887	8,261
Richmond																	1,088	4,630	5,718
Riverside									5,622	3,712		6,783		43					16,160
Rolling Mill	220,146	1,668	163	1,528	1,820	3,437	4,403	1,058	402									3,975	238,600
Saginaw	389,981	30,793	16,276	9,108	946							4,320							451,424
Salisbury (B)	194,153	43,690	42,243	17,028	26,629	29,503	51,667	48,304	74,947	72,449	85,798								686,411
Sam Mitchell							8,823	8,411	546										17,780
Samson (Argyle)	223,507	4,584	12,421	15,700	1,334		1,133		4,512	2,796	1,218		600						267,805
Schadt																1,261			1,261
Section 12	5,357	13,243	3,287																21,887
South Buffalo (A)								4,964	24,706	69,359	146,383								245,412
Spurr	142,806	2,746	8,873	9,067			752												164,244
Star West (Wheat)	7,404	9,040	9,554	6,625	6,824	9,200	15,867	17,538	4,987	7,997	15,141	4,412			5,550	51,207	9,658	942	181,946
Taylor	1,110	10,559	15,146	6,155															32,970
Titan			1,778	13,128	19,411	23,340	13,865	16,003	2,846										90,371
Volunteer	223,853	39,276	41,456	19,414	11,748	5,679	24,034	47,486	56,321	60,156	141,524	92,699	127,130	69,561	26,946	32,672	53,216	1,617	1,074,788
Webster			4,443		934		6,229	2,054		448									14,108
West Republic		7,354	27,865	30,734	19,623	12,700	10,558	12,872	9,861	1,510									133,077
Wetmore			1,777	2,777	4,585	5,887	10,756	3,335	2,074	19,679									50,870
Wheeling					4,098	6,383		74											10,555
Winthrop											109,576	122,042	191,658	180,071	134,365	119,120	150,496	106,894	1,114,222
Total	14,019,480	1579,834	1829,394	1305,425	1558,034	1430,422	1627,380	1851,634	1923,727	2642,813	2993,664	2512,242	2666,856	1835,893	2059,330	2097,838	2604,221	2715,035	49,253,222
Mesabi Range.																			
Adams																59,141	234,562	175,802	469,505
Aetna (Lowmore)														1,645			17,723		19,368
Auburn															108,210	376,970	131,478	175,263	791,921
Biwabik														151,500	90,048	247,069	242,565	427,464	1,158,646
Canton														24,416	213,853	359,020	16,261		613,550
Cincinnati														26,372		17,187	57,324	32,912	133,795
Cloquet (Vega)															5,628	47,700	96,280	12,215	161,823
Commodore														65,137	7,213		22,063	60,798	155,211
Duluth														37,626					37,626
Fayal																136,601	248,645	642,939	1,028,185
Franklin														46,617	223,399	286,423	231,086	30,128	817,653
Genoa																	17,136	309,514	326,650
Hale														3,616	24,167	31,004	70,006	13,728	142,521
Lake Superior																58,123	67,659	259,912	385,694
Mahoning																117,884	167,245	519,892	805,021
Minnewas														13,858	2,140				15,998
Mtn. Iron (& Rath)													4,245	119,818	573,440	371,274	142,021	773,538	1,984,336
Norman															38,999	93,392	77,523	101,077	310,991
Ohio																28,943	69,925	47,350	146,218
Oliver (I)														123,015	505,955	500,377	808,291	601,072	2,538,710
Penobscot																		11,933	11,933
Roberts																		18,614	18,614
Sellers																47,433	153,037		200,470
Sparta																		66,722	66,722
Williams (N. Cin'ti)																3,046	11,249		14,295
Total													4,245	613,620	1793,052	2781,587	2882,079	4280,873	12,355,456
Miscellaneous					1,879	441													2,320

NAME OF MINE.	Prior to 1881	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	TOTALS.
Menominee Range.																			
Antoine																27,931	110,821	98,847	237,599
Appleton													4,377	5,618		2,107			12,102
Aragon										1,745	46,609	96,829	167,948	127,901	138,209	183,296	95,809	149,594	1,007,940
Armenia										50,275	26,649					2,045			78,969
Beta							1,585	1,226				1,400							4,211
Breen	17,430																		17,430
Brier Hill			10,593	4,388															14,981
Calumet			5,847	29,239	3,627														38,713
Chapin	34,556	134,521	247,506	285,830	290,972	157,455	198,871	336,128	290,871	518,990	742,843	488,749	660,052	489,134	235,895	618,589	420,318	643,402	6,774,682
Claire													57,352	9,612					66,964
Columbia (H)			15,948	4,334	6,774		14,282	2,377	10,936	11,385	60,133	70,770	57,682	22,426	10,300	70,967	87,202	24,623	470,039
Commonwealth	9,643	97,410	115,862	21,493	34,622	42,947	51,189	56,600	61,818	103,515	116,786	134,982	249,113	151,291	174,921	208,880	93,707	98,283	1,828,071
Cornell	30,856	11,816					4,566	2,064											49,302
Crystal Falls			1,341								3,974					13,037	44,526	95,210	158,088
Cundy (Quinnesec)	120,315	43,711	44,240	21,676	16,995	14,110	13,442	6,585	2,249							761	3,395	41,942	329,421
Curry (G)	34,654	17,534	13,374	3,676	10,079	4,897			5,376	28,722	72,162	100,681	125,773						416,928
Cyclops (G)	66,554	12,644	18,287	22,675	24,099	49,897	37,189	14,297	14,693	6,101	7,361	10,599	1,697						286,093
Delphic				3,410	508	9,880	17,648	2,272									52		33,770
Dunn								24,677	118,096	151,828	156,963	162,721	133,666	58,590	24,538	90,885	47,081	31,062	1,000,107
Emmett	66,007	648																	66,655
Fairbank			8,045	455															8,500
Florence	14,143	100,501	160,155	40,232			8,210	79,399	142,585	196,269	218,570	48,806	48,246	9,634	2,726	22,820	35,136	37,594	1,165,026
Great Western			587	22,825	20,710		22,267	23,239	21,860	38,454	72,546	62,464	87,487	661			14,643		387,743
Groveland												1,049							1,049
Half and Half										5,961	1,496	67							7,524
Hamilton							872	600	8,801	8,347	17,072	58,197	2,183						96,072
Hemlock												35,531	65,459	11,323		949	94,645	96,032	303,939
Hersel											955								955
Hiawatha														1,683		1,201			2,884
Hollister											2,020	1,057	1,021						4,098
Hope													15,543	2,275					17,818
Indiana			4,280	4,362	636	2,739	5,854												17,871
Iron River			29,115	100,369	52,584	55,693	78,591	83,018	110,000	179,238	155,458	59,345	1,176						904,587
Keel Ridge	11,496	19,511	23,425	5,033									5,997	3,298		19,441			88,201
Lee Peck (D)													2,844						2,844
Lincoln												1,813	26,019	8,757					36,589
Loretto														8,131	55,983	53,160	34,334	54,104	205,712
Ludington	8,816	3,374	52,152	102,632	101,165	124,194	74,454	101,653	61,883	116,297	97,355	141,303	15,777	109	354				1,001,518
Manganate											6,844								6,844
Mansfield											18,303	49,836	69,259	69,558				37,182	244,138
Mastodon			3,477	18,577	18,187	11,737	41,640	48,792	51,463	63,511	66,526	45,370	9,150	23,485		23,733	60		425,708
Metropolitan			23,854	36,643	27,577		6,393	9,070	3,490										107,027
Michigan Explo. Co.														505	77	1,071		216	1,869
Millie (Hewitt)		4,352	9,500	7,516	7,927	4,627	5,517	1,163	11,124	12,274	39,232	5,889	6,780		13,062	10,924	21,815	10,374	172,076
Monitor (Lamont)										12,348	31,139	26,226	42,819	13,777	2,600				128,909
Nanaimo			2,480	29,221	37,620		5,400	30,460	5,744		3,441	13,200							127,566
Northwestern				7,202	10,004														17,206
Norway (G)	278,969	137,077	165,547	114,836	71,710	67,741	93,878	95,726	87,260	68,044	61,717	4,089	44,767						1,291,352
Paint River			6,515	5,973	11,652	2,373	13,933	10,240	12,506	32,700	62,654	45,435	18,390						222,371
Penn Iron M'g Co.														280,450	175,274	290,622	179,917	237,886	1,164,149
Perkins	62,661	60,406	73,648	76,514	38,120	18,020	12,852	10,834	16,684	12,354	11,971					2,161			397,225
Perry				3,138															3,138
Pewabic											26,991	64,507	115,273	165,745	304,010	262,551	273,587	279,855	1,492,519
Selden							790	1,302											2,092
Sheridan										1,102	595	7,137	45,745	2,234		16,754	3,419	146	77,132
South Mastodon									2,722	4,005	1,476								8,203
Stephenson	23,887	10,856					1,018	3,589											39,350
Sturgeon River								6,829	7,800	4,775									18,404
Vulcan (G)	187,343	85,274	94,042	79,874	101,722	124,125	143,930	205,036	129,541	153,900	104,996	78,967	179,904						1,668,654
Walpole								1,740	900	9,614	2,940	3,895							19,089
Youngstown			6,198	15,292	8,344		25,635	34,418	12,699		44,460	3,705				13		661	151,425
Total	967,321	739,635	1136,018	1047,415	895,634	690,435	880,006	1193,343	1191,101	1796,754	2282,237	1824,619	2261,499	1466,197	1137,949	1,923,798	1,560,467	1,937,013	24,931,441
Vermillion Range.																			
Chandler									54,612	306,220	336,002	373,969	651,655	435,930	558,050	605,024	471,545	438,365	4,231,372
Minnesota					62,124	225,484	304,396	394,252	457,341	535,318	532,000	517,570	498,353	370,303	390,463	432,760	448,707	592,196	5,761,267
Pioneer										3,144	12,012	3,079	2,651			40,054	149,073	207,103	417,116
Zenith													14,991	14,388			18,765	40,817	88,961
Total					62,124	225,484	304,396	394,252	511,953	844,682	880,014	894,618	1167,650	820,621	948,513	1,077,838	1,088,090	1,278,481	10,498,716
Gogebic Range.																			
Anvil								10,075	24,676	47,000	45,690	73	42,090		13,297	68,064	57,483		308,448
Ashland						6,741	74,015	175,563	174,183	257,915	435,949	267,439	231,896	66,067	83,020	126,096	91,149	111,625	2,101,658
Atlantic								1,369								70,989	60,727	50,307	183,392
Aurora						5,422	94,553	159,252	179,937	199,865	246,695	83,554	319,482	179,028	203,152	245,883	187,169	160,122	2,270,114
Bessemer							4,788	16,101											20,889
Blue Jacket								1,799											1,799
Brotherton							8,880	21,721	40,639	53,267	80,486	46,574	130,833	18,905	47,148	40,587	50,490	46,186	585,646
Cary (and Superior)										56,542	116,203	121,186	106,484	28,578	16,559	52,349	38,821	37,308	574,030
Chicago																	504		504
Colby (E)					1,022	84,302	257,432	258,518	285,880	136,833	193,038	9,619	69,968	59,346	32,616		48,492	22,921	1,450,987
Comet											2,882	10,144	54,779	9,604	11,782				89,191
Davis											1,497		21,754	15,210		10,253			48,714
Eureka											23,794	13,907	10,655	31,385	18,329	26,105	4,544		128,719
Father Hennepin									28,721	76,545	63,903	15,759							184,928
Federal											21,150	6,778							27,928
First National								1,997											1,997
Germania						5,468	19,734	61,714	53,918	103,169	52,000	22,383	4,283	7,964				1,015	331,648
Imperial													8,515						8,515
Iron Belt									30,000	51,551	110,368	1,506	161,635	23,976	45,109	148,228	81,351	96,763	750,487
Iron Chief							9,950	2,249											12,199
Iron Chief No. 2							551												551
Ironton							18,424	24,762		8,635	6,247	300							58,368
Jack Pot													3,944	1,651				1,265	6,860
Kakagon							18,497	52,179	1,228										71,904
Mikado																4,788		11,397	16,185
Montreal							23,013	43,989	38,015	42,724	16,728	70,108	58,728	34,299	46,037	138,882	131,531	191,106	835,160
Newport							20,184	75,660	69,145	36,987	71,488	105,606	165,962	109,718	150,392	157,821	142,369	150,979	1,256,311
Nimikon							4,105	24,217	1,313										28,635
Norrie						15,419	124,844	237,254	412,196	674,394	906,728	758,572	985,216	472,062	621,608	738,480	329,068	604,281	6,880,122
Odanah							13,714	30,475	5,412	13,354	1,065		6,711	3,956	2,437				77,124
Pabst						1,103	17,979	19,906	49,976	116,376	172,069	130,226	113,245	104,510	206,074	219,960	68,984	220,496	1,440,895
Palms								1,414	9,725	35,245	50,604	32,227	102,382	2,658	37,911	46,965	114,108	207,153	640,392
Pence									26,687	574							13,185	120	40,566
Ruby (Puritan)							16,388	45,000	3,058	9,472	11,694	913							86,525
Section 33										73,370	126,963	38,576	14,681						253,590
Shores																	12,196	16,102	28,298
Sparta													2,912			1,950			4,862
Sunday Lake						1,405	10,963	18,137			6,010	64,902	56,046	22,876	34,323	20,970	89,441	45,815	370,888
Superior							2,690	27,763			36,675	10,710	13,192		30,597				121,627
Tilden												28,415	233,356	135,118	209,077	418,188	250,205	276,890	1,551,249
Trimble							10,780	12,764	2,387										25,931
Tyler's Forks											10,683								10,683
Valley							1,878												1,878
Windsor										14,576	37,210	97	53,242	2,474		11,438	28,154	385	147,576
Total					1,022	119,860	753,362	1322,878	1437,096	2008,394	2847,810	1839,574	2971,991	1329,385	1809,468	2,547,976	1,799,971	2,258,236	23,047,023
GRAND TOTAL	13,010,705	2319,469	2965,412	2352,840	2518,693	2466,642	3565,144	4762,107	5063,877	7292,643	9003,725	7071,053	9072,241	6065,716	7748,312	10,429,037	9,934,828	12,469,638	120088,178

A—Now Queen I. M. Co. F—Succeeds Buffalo Mining Co. B—Now Iron Cliffs. K—Under Clev'd-Cliffs I. Co after '95. I—Mesabi Mtn. and Lone Jack. C—1893 and later in Winthrop. D—Cherry Valley Ore. E—Includes Tilden up to 1891. G—1893 and later under Penn Iron Mining Co. H—Formerly Shafer, Shelden, and Union.

enrollment of these vessels, but this view of the case failed to take into consideration the fact that the small vessels are becoming more and more unprofitable to operate, and the number of those in commisson each season is growing smaller. As a matter of fact, a comparison of the tonnage lists for 1896 and 1897 shows that there were 225,000 tons of vessels under 1,200 tons enrolled during the season of 1896 at 3 cents per net registered ton, while during the season of 1897 only 185,000 tons of this class of vessels were enrolled to pay dues of 2 cents per ton. Of this 185,000 tons of small vessels, 113,000 tons were vessels belonging to members whose fleets in the main consist of the larger class of boats. Under the rule of the association that members must enroll the whole of their tonnage or none, the smaller vessels followed the larger vessels into the association. The tonnage of the fleets consisting entirely of the smaller vessels only amounted to 72,000. The summary of the treasurer's report shows that his receipts from all sources during the past year have amounted to $20,123.24, and the disbursements to $20,046.06, leaving a balance on hand of $77.18. The association has unpaid liabilities at the present time amounting to $3,200. There is no other indebtedness of any kind in sight at present, but there will be about $170 of rents of shipping offices to pay before the first of May, and there will undoubtedly be some small incidental expenses for traveling and incidentals of the secretary and treasurer's office. The unpaid dues amount to $270.47, of which $229.00 is due from two members of the association. A good part of the uncollected dues will undoubtedly be collected before the first of May, and in that event the association will begin the season of navigation of 1898 with a total indebtedness slightly exceeding $3,000.

The board of managers think that this deficit of $3,000 ought to be wiped out during the coming year. It is probable that the tonnage of the association will not show any great change, but that whatever change there is will be an increase. There will be some further withdrawals of the smaller vessels, which will be offset by the large boats now building for fleets which have always been members of the association and can confidently be counted on for the future. The expenses of the association during the past year for traveling, for delegations to Washington on legislative matters, and for miscellaneous items of all kinds, have been unusually small, and it is unlikely that they will be so slight another year. The only way to wipe out the deficit of the association, and start in another year without indebtedness, provided the income of the association remains stationary, is to reduce the permanent expenses, and this problem will undoubtedly occupy the attention of the newly elected board of managers.

OPERATIONS OF THE SHIPPING OFFICES.

Shipping offices of the association have been maintained during the past year at Cleveland, Chicago, South Chicago, Buffalo, Ashtabula, Toledo and Milwaukee. The following condensed report taken from the annual report of Shipping Master Rumsey shows the number of men placed on board at all of these ports: Put on board at Cleveland, 3,117; sent from Cleveland to other ports, 126; put on board at Chicago, 2,515; sent from Chicago to South Chicago, 13; put on board at South Chicago, 1,566; at Buffalo, 1,745; at Ashtabula, 1,623; at Toledo, 1,049; at Milwaukee, 1385; making a total of 13,139 men shipped at all the shipping offices, compared with 11,838 in the preceding year. The Cleveland shipping office shows a large growth in business, the number of men shipped last year being 3,170, compared with 1,503 in 1896. The South Chicago office shows a decrease in operations, the number of men shipped in 1897 having been 1,566, compared with 2,739 in 1896. The operations of the Milwaukee shipping office show a gratifying increase. This office was first established in 1896, and during that year it only shipped 453 men. During the past year 1385 men have been put on board at Milwaukee. The attention of the members of the association who do not use the shipping offices is called to the shipping master's report. Its examination will convince them that these offices do a very extensive work, and that they serve a most useful purpose. It cannot be doubted that the existence of such agencies for supplying vessels with necessary hands is of value, not only to those who use the shipping offices, but to all other owners of lake vessels. An examination of the treasurer's report shows that about $8,920.89 per annum of the association's funds are required to maintain and operate these shipping offices. It has therefore cost the association during the past year about 68 cents for each man put on board a vessel by a shipping office.

GRAIN SHOVELING AT BUFFALO.

At the annual meeing in 1897, the Lake Carriers' Association renewed its contract with James Kennedy of Buffalo, to shovel all grain sent to that port in vessels of the association. The scale of charges for shoveling remained as in former year, with a provision in the contract that any decrease in the rental of steam shovels should inure to the benefit of the vessels, and the contract price received by Mr. Kennedy should be diminished to that extent. A small committee was appointed at the annual meeting with Mr of Buffalo as chairman, to confer with the elevator people in Buffalo with a view to obtaining some concession in the shoveling charges at that port by securing a decrease in the rental of the steam shovels. After a somewhat prolonged negotiation, the elevator owners made a concession of 15 cents per thousand in the charge for the rental of steam shovels, and the vessel owners secured a reduction to that extent in the charge for handling grain. The grain receipts at the port of Buffalo during the past year, including flax seed, but excluding flour, have been 205,000,000 bushels, and a reduction of 15 cents per thousand has therefore amounted to a saving in shoveling charges paid by vessels of $30,750. It will be noted by the members of the association that this saving in shoveling charges last season is about 50 per cent. more than the entire annual dues collected from the members of the association. It may also be noted in this connection that during the past year the shippers of hard coal at Buffalo have generally required vessels chartered by them to purchase their fuel from the shipper, but no cases have been reported in which any attempt was made to charge vessels any more for fuel in such cases than the regular prices prevailing at the fueling docks not owned or controlled by the hard coal shippers. The abuses which prevailed in this business prior to 1896, have not re-appeared, and the fight which the association made against the excessive charges for fuel at Buffalo appears to have been permanently successful.

PRIVATE LIGHTING IN 1897.

The association has been able to reduce its expenses for private lights in the Detroit river during the season of 1897 to a smaller sum than has ever been expended for this purpose during any year in the history of the association. The total expenses for private lighting in 1897 have been $2941.42. It is not believed by the officers of the association that any further reduction in this expense can be made for the present. There are no longer any private lights maintained on American soil or in American waters. The only lights which we now maintain are the range lights lighted by Duff & Gatfield above the Lime-Kiln crossing, the Hackett ranges at Amherstburg and the floating lights maintained by Hackett below the crossing. These are all necessary and expense of maintaining them has been reduced to as low a figure as is consistent with their proper maintenance and supervision.

AIDS TO NAVIGATION.

Perhaps the most important feature of the work of the association during the past year in the legislative field has been the success in the efforts of the committee on navigation in securing the lighting of lake channels and waterways on a very considerable scale by gas buoys. The officers and managers of the association having this matter in charge have been working for several years to secure the appropriation for a considerable number of gas buoys on the lakes. After a number of disappointments, they succeeded last season, with the powerful assistance of Senator McMillan of Michigan, in securing a substantial appropriation for gas buoys, with a distinct provision in the appropriation bill that the buoys should be sent to the great lakes. Forty of these gas buoys have already been sent by the light-house board to the various lake light-house districts, and during the season of navigation just closed, twenty-nine of these have been in actual service, in addition to the two Canadian gas buoys in Point au Pelee passage. The twenty-nine located buoys have been established at the following points: Seven buoys at various points in the St. Lawrence river between the foot of Lake Ontario and the port of Ogdensburg; one on Charity shoal, Lake Ontario; two in Erie Harbor; one on Starve island reef, Lake Erie; two in Maumee bay, Toledo Harbor, Lake Erie; three at Ballard's reef channel, Detroit river; one on the northwesterly side of the lower entrance to 20-foot channel, Lake St. Clair; one on the Port Huron middle ground, St. Clair river; one at Detour reef, Lake Huron, at westerly side of entrance to St. Mary's river; one at the turning point in Mud Lake, St. Mary's river; one at the turning point Dark Hole, St. Mary's river; one at Hay Lake channel, entrance northerly end of Little Mud lake, St. Mary's river; one on Round island, middle ground, St. Mary's river; one on Fisherman's shoal, Lake Michigan; one on Wiggins point shoal, Lake Michigan; one on Lansing shoal, north of Squaw Island, Lake Michigan; one at Poverty island shoal, entrance to Green bay, Michigan; one on Gravelly Island shoal, entrance to Green bay, Lake Michigan; one on Whaleback shoal, Green bay, Lake Michigan.

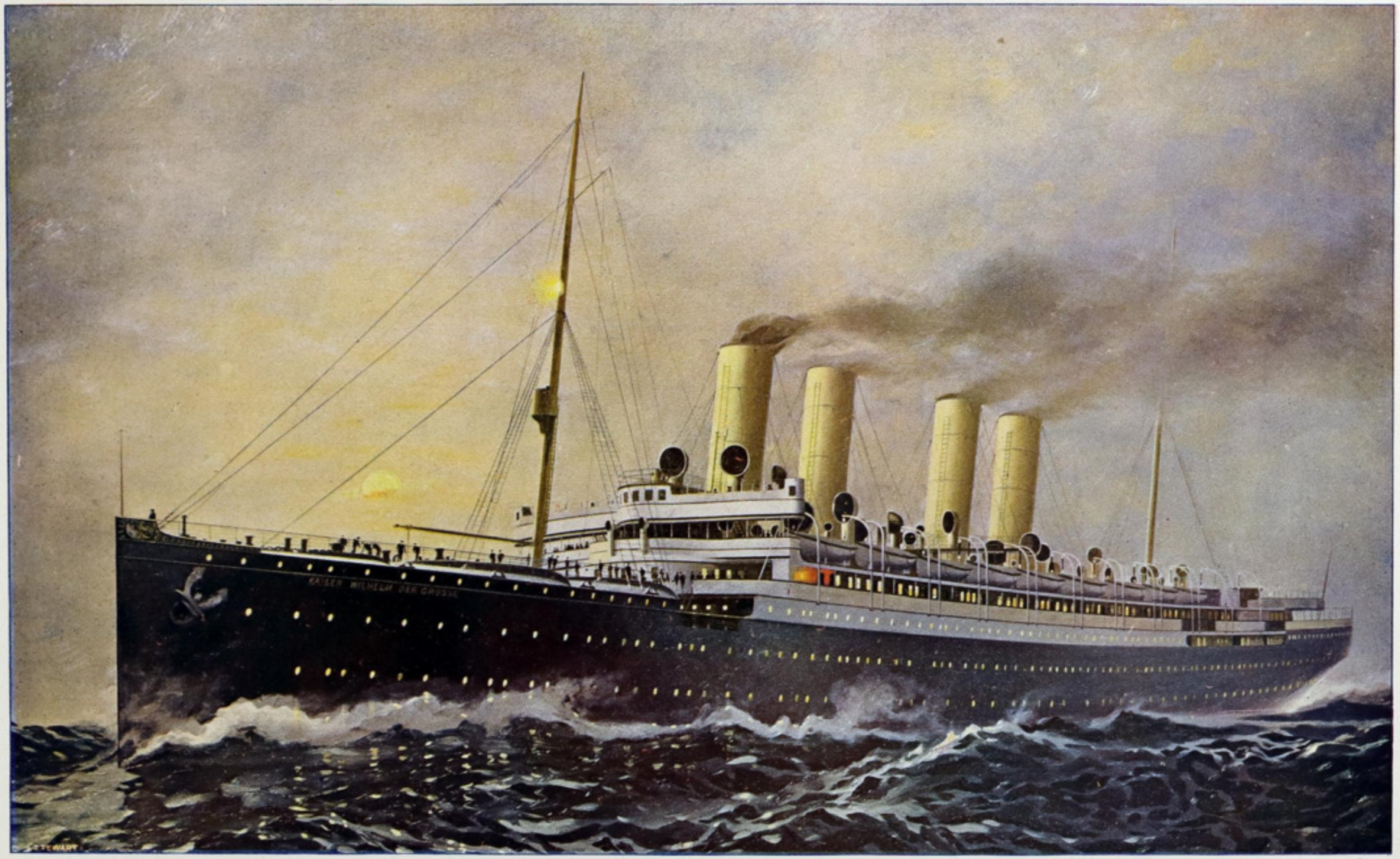
There are seventeen other points on the lakes where gas buoys are still needed, and where their establishment has been recommended by the light-house officials in charge of the various lake districts. The board of managers hopes that a moderate appropriation can be obtained from congress at this session which will provide part, if not all, of these additional gas buoys. These gas buoys are very heavy, bulky and awkward affairs to handle, and when you remember that they have to be taken up every fall and placed again every spring, that they have to be kept supplied with gas, and replaced on their stations if they become in any way displaced, and that they cover a territory stretching from the St. Lawrence river to Lake Superior, and also into Lake Michigan, so that a vessel in visiting all these buoys would travel about 2,000 miles, it will readily be understood that the establishment of so large a number of gas buoys has placed upon the light-house board a large amount of extra labor and taxed their present facilities to the utmost. It is understood that the board is favorable to the extension of this system of lighting and desires to make proper provision for the handling and care of these buoys. The Lake Carriers' Association should do everything in its power to assist the board in securing proper facilities of this kind, and if the board decides to ask congress for an appropriation for additional vessels for light-house service on the lakes, so as to permit one of the present light-house tenders to be fitted up exclusively for work in connection with gas buoys, the officers of the association will do all in their power to secure the necessary funds from congress for this purpose. During the past season the chairman and naval secretary of the light-house board have both made extensive tours of the lakes and have in every way manifested the greatest interest in the improvement of the lighting system.

CHANNEL IMPROVEMENTS.

Early in the present season of navigation the association made an investigation of the present condition of the channel improvements in the Detroit, St. Clair and St. Mary's rivers, at the suggestion of the Hon. Russell A. Alger, secretary of war, with a view to calling his attention to the condition of the work and the necessity of any supplemental improvements to perfect the great work which the government has undertaken. In making this investigation the officers of the association did not have in mind any further deepening of the channels, but rather the process of widening them and rounding off the corners at the turns, so as to make them safer. The ship-channel west of Buffalo, upon which the government has been engaged for many years, was a project outlined in the first instance by Gen. Poe. He fully understood that in certain places the improvements which he outlined were not final in character, and that the channels provided at such places were not of sufficient width for the accommodation of the increasing commerce which would pass through them. Where a sufficient width could be provided at a moderate expense Gen. Poe made his channels wide, as at the foot of Lake Huron, but where the work was very expensive in character, his idea was to give a narrow channel at first, leaving further improvement to the future. In August last the report of the association was presented to the secretary of war, containing the following recommendations:

First—That the cut at Lime-Kiln crossing, which is now 440 feet wide, with quite a sharp turn at each end, be widened to 600 feet, and the angles above and below be cut off so as to make easy approaches.

Second—That the channel at Ballard's reef, which is now being



NORTH GERMAN LLOYD EXPRESS STEAMER KAISER WILHELM DER GROSSE.

(The largest and fastest steamship in the world.)

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891	204	111,856 45
" " " 1892	169	45,968.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,352.70
" " " 1896	117	108,782.38
Total	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation	232	231	231	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

The cost of maintaining modern naval vessels is a big item in affairs of the government. Nearly $9,000,000 was required last year for the pay of officers, seamen, stores, coal and repairs for the vessels carried on the naval register. This is, of course, aside from numerous other items of naval expense connected with dock yards, department operations in Washington and the various bureaus conducted by naval officers ashore. To maintain the flagship New York in commission for twelve months costs just $391,085, while the triple-screw Columbia and Minneapolis cost respectively $263,267 and $298,455. Of the battleship class, the Indiana was the most costly vessel, with $323,695 paid out for her maintenance, while the Massachusetts, attached to the same station, required $290,435 to keep her in service, and the Oregon, on the Pacific station, $286,515. The fast armored cruiser Olympia, flagship of the Asiatic fleet, cost for one year $356,889. The flagship San Francisco, of the European station, cost $242,845, while the Philadelphia cost $297,577. The second-class battleships Maine and Texas were less expensive to maintain in service, and required expenditures of only $260,000 each.

With several hundred steel ships now on the lakes, all of them needing repairs each winter, positions have been provided for several practical ship builders, who represent vessel owners in supervising these repairs, as well as in overseeing the construction of new ships. Robert Curr of Cleveland who has been especially successful in work of this kind by Pickands, Mather & Co., and who is now looking after the construction of a steel barge at West Superior, writes a friend in Cleveland that he has made thirty-three surveys at the head of the lakes in addition to four at Chicago, and he has a list of fifteen others that are to be made before the opening of navigation next spring.

"We have been thinking for some time past of adding a steel barge or two to our fleet," said Capt Thomas Wilson, in referring to his purchase of the barge which the Globe Iron Works Co., had under construction for W. H. Becker. "We had nine steamers and only one barge, and as four of the steamers are steel vessels we will probably find it profitable to add this barge to the fleet." The new barge is 388 feet over all, 376 feet keel, 44 feet beam and 26 feet deep, and will carry about 5,400 tons of ore on 17 feet draft.

Senator Frye has introduced in congress a bill authorizing the secretary of the treasury to have eight vessels constructed for the use of the revenue cutter service, four of them to cost $160,000 each, one to cost $250,000, and the other three $45,000 each. All are for coast service. The first four are to be used in replacing the Seward, the McLane, the Colfax and the Boutwell, and the last three in replacing the Washington in Philadelphia harbor; the Hamlin in Boston harbor, and the Chandler in New York harbor. The $250,000 vessel is to be used at the Columbia river bar on the Pacific coast.

The statement in the Pittsburgh papers to the effect that in a few days the Pittsburgh, Bessemer & Lake Erie railroad would be moving ore from Conneaut to the Duquesne furnaces of the Carnegie Steel Co. is premature. Work is being pushed as fast as possible, but it is not probable that ore will be delivered at Duquesne by the new road before April 1, if then.

SUPPLEMENTAL ILLUSTRATIONS.

NORTH-GERMAN LLOYD STEAMER KAISER WILHELM DER GROSSE.

A description of this steamer may be found in the Marine Review, Aug. 12, 1896, but the principal dimensions and a few additional particulars are given herewith. She is the largest and fastest vessel afloat, having beaten the Lucania's record, consuming 50 tons less coal per day than the Cunard steamer. The Kaiser Wilhelm der Grosse was built at the Vulcan works, Stettin, Germany, and is 625 feet between perpendiculars, 66 feet beam and 42 feet molded depth. Her length over all is 649.6 feet. Her gross tonnage is 14,349, net 5,521, her load displacement being 19,684 tons. She is fitted with bilge keels, over 1,500 passengers can be accommodated, and her crew numbers 461 men; 200 being connected with the engineer department. The exact sizes of the cylinders of her triple expansion engines are 52, 89.81, and two 96.5 inches, the stroke being 68.9 inches. Their sixty-six auxiliary engines have 124 steam cylinders. The pump equipment is of the Blake pattern. Steam is furnished by fourteen boilers, twelve double-ended boilers 20 feet 5.7 inches long, and two single-ended 11 feet 6.7 inches long, having 104 furnaces and a total grate surface of 2,392 square feet. Her best time from the Needles to Sandy Hook was 5 days 11 hours and 35 minutes.

OFFICERS AND MEMBERS OF COUNCIL OF THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS.

These two groups of portraits show all the officers and all but a few of the members of the council of the society. It is the first time that more than a half dozen or so of these portraits have been published, and the Review is very much pleased to be able to present portraits of twenty-six of the most brilliant men interested in shipbuilding and engineering in the United States.

A GROUP OF SHIPBUILDERS.

Portraits of twenty-one shipbuilders are shown in this illustration. In it are shown men who have built some of the largest battleships and cruisers for the U. S. Navy, and men who are building up the merchant navy on the great lakes, including the largest and most modern coarse-cargo carrying steamers in the world. There are included as well, a number of builders of smaller craft, some of whom design their own boats, decide upon the necessary power, and in some cases do their share of the actual labor required.

MARINE BUSINESS MEN OF THE UNITED STATES.

A year ago the Review published portraits of nearly one hundred marine business men of the United States. It attracted a great deal of attention. Since then we have been adding to our collection, and present another group of twenty-one men who come in contact in a business way with the shipbuilders and shipowners of the country.

VIEWS OF VARIOUS CRAFTS.

The view on the left shows the yard of Sherwood L. Embree & Bro., Quincy Point, Mass., where a number of light craft are building. The yacht is 55 feet over all and was built by E. G. Heald, Auburn, N. Y. The schooner ready to launch is the Viator, built by J. B. Nutt, Perry, Me. The Roseada was built by Clay Johnson, Kissimme, Fla., and carries mail between Myers and Fort Thompson. The center picture shows the barge Kalmia and back of it is the yard of Robert Palmer & Son, Noank, Conn., where during 1897, nine car floats, sixteen barges, six lighters, a steamer and a schooner were built. They aggregate 17,464 tons and would reach seven-eighths of a mile if placed end to end. The steamer shown is the Manisees, 102 feet long, 26 feet beam and 9 feet 9 inches deep. She was built at the Palmer yard and is owned by the Naragansett Pier Navigation Co.

MISSISSIPPI RIVER STEAMER HILL CITY.

This is one of the largest river steamers in the United States. She is 320 feet long and 80 feet over the guards, her moulded beam being 45 feet. Her tonnage loaded is 2,200 tons. She was built by David Barmore, Madison, Ind., and belongs to the St. Louis & New Orleans Anchor Line.

U. S. TORPEDO BOAT.

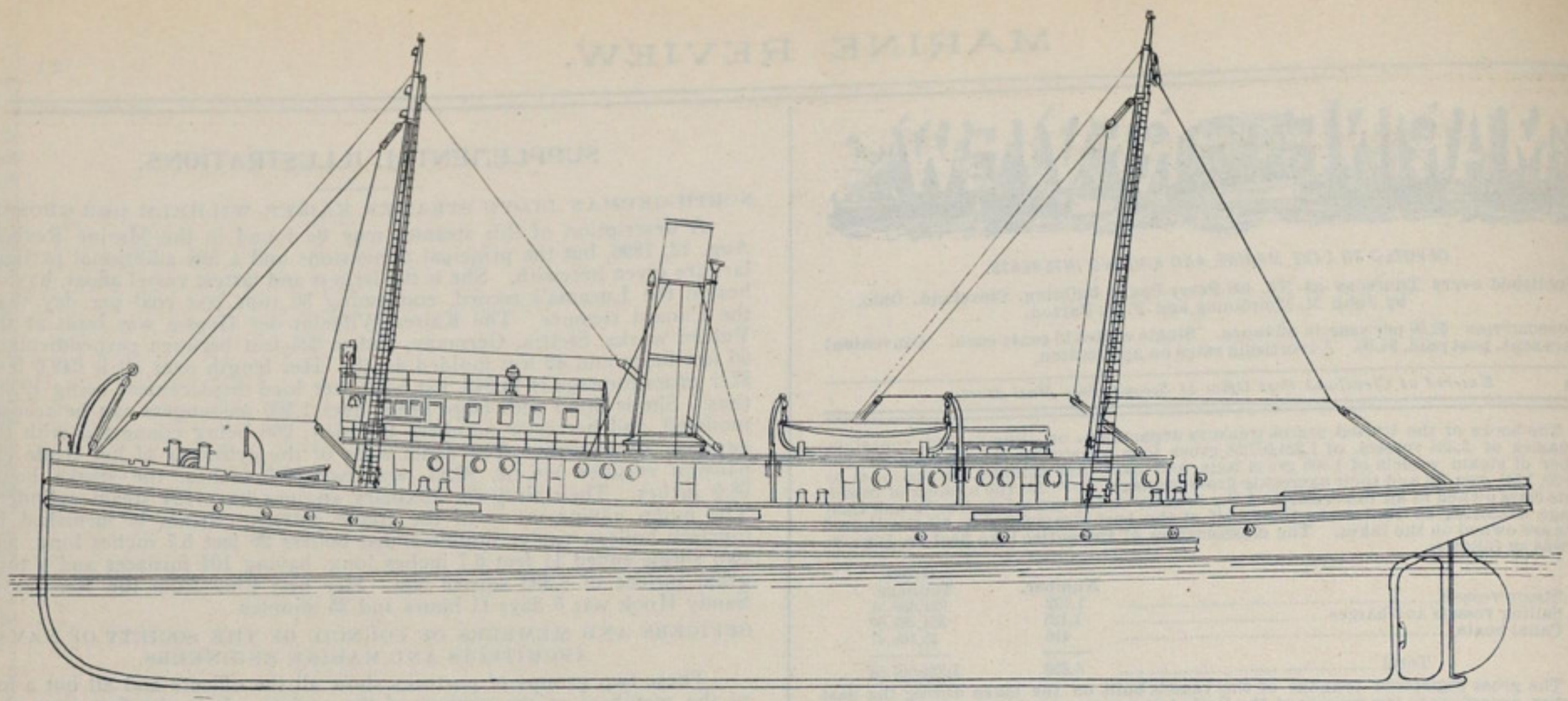
This shows an unarmored torpedo boat making 28 knots an hour. Some twenty boats of this class will be in commission within the next six months. They were built at the following shipyards within the past two years: Herreshoff Mfg. Co., Bristol, R. I.; Iowa Iron Works, Dubuque, Ia.; Columbian Iron Works, Baltimore, Md.; Moran Bros., Seattle, Wash.; Bath Iron Works, Bath, Me.; Union Iron Works, San Francisco, Cal.; Wolff & Zwicker, Portland, Ore.; The Chas. Hillman Co., Philadelphia, Pa.; Harlan & Hollingsworth Co., Wilmington, Del.; and Gas Engine & Power Co., New York, N. Y.

VIEWS OF FOUR PRINCIPAL SHIP YARDS.

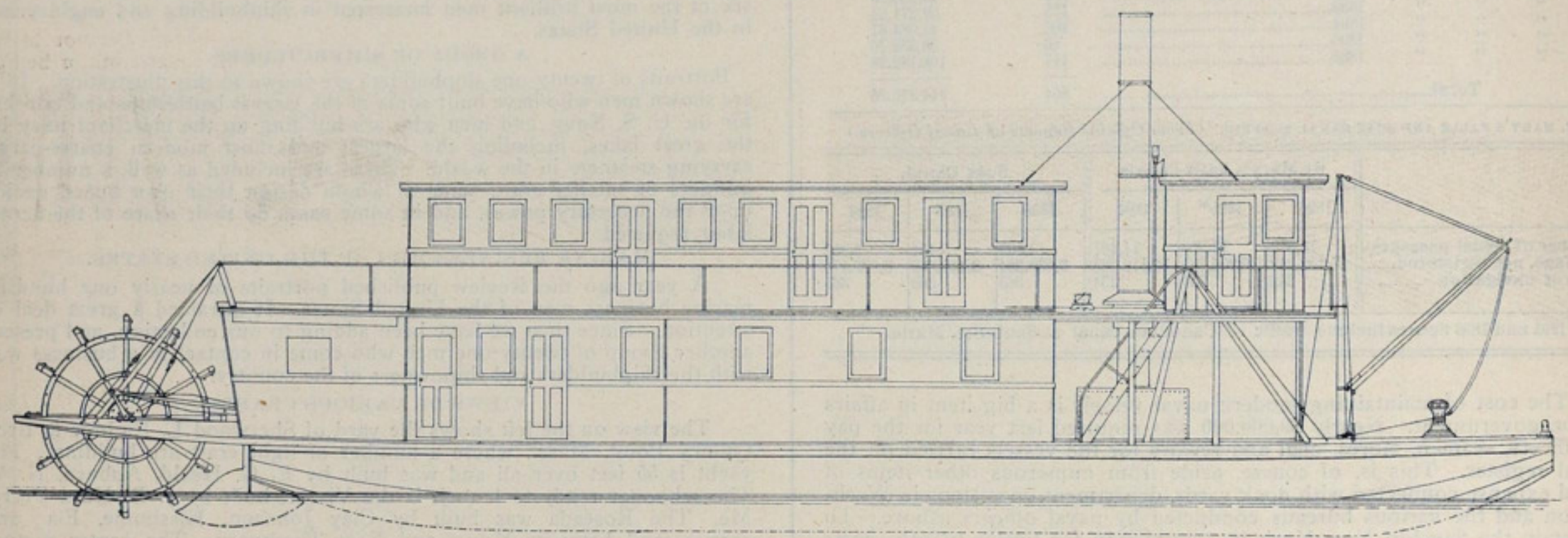
Views from the shipyards of Wm. Cramp & Sons' Ship & Engine Building Co., Philadelphia, Pa.; J. H. Dialogue & Son, Camden, N. J.; The Cleveland Ship Building Co., Lorain, O.; and the Globe Iron Works Co., Cleveland, O., are included on one of the supplements. The photographs were taken within the last month for this edition. Cramp's yard covers 32 acres and has over a quarter of a mile river front. The view of the Cleveland company's new plant at Lorain shows the largest dry dock on the lakes, 560 feet long, its size being exceeded by only two private and two naval docks in the United States. The tools for shipbuilding are operated by electricity, and represent the most modern practice in the country. The recent purchase of the Shipowners Dry Dock Company's two docks by the Globe Iron Works Company gives them a water frontage of nearly a half mile. The view of Dialogue's yard shows a fire boat for New York City on the stocks, and a small passenger steamer.

AMERICAN LINE STEAMER ST. PAUL.

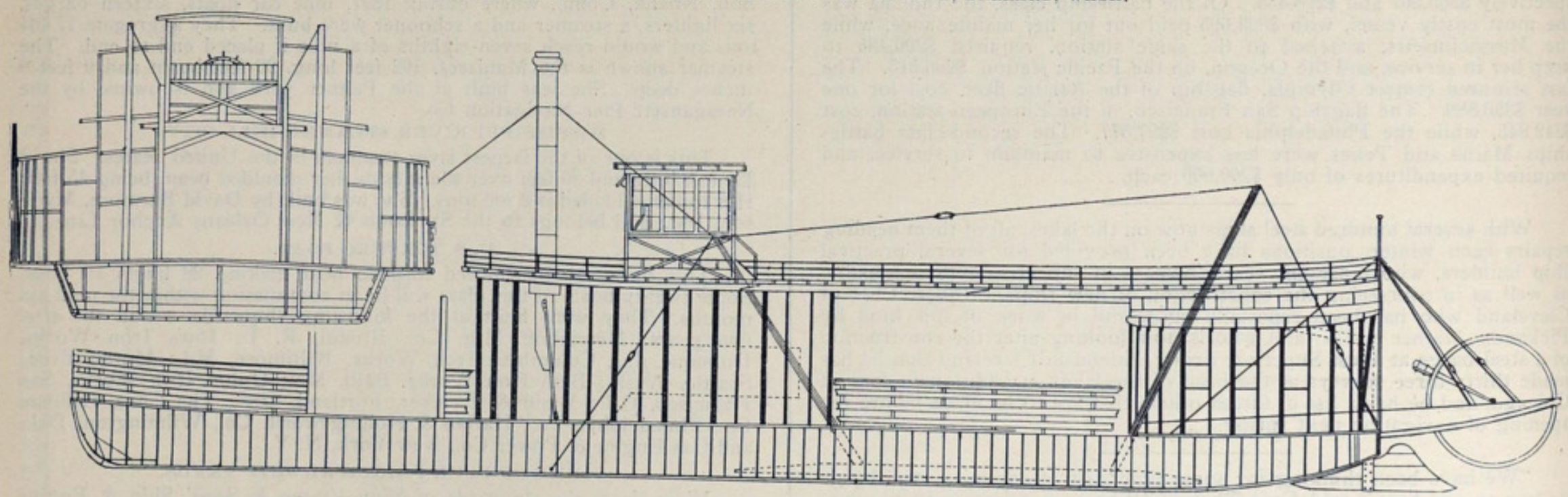
In presenting the illustration of this American-built American line steamer, the claim can be made that she is the most efficient and most economical of all transatlantic liners. While there are three steamers in the Atlantic ferry business that are faster, they are only a couple of hours faster and to gain these few hours in six days they have a third more horse power and machinery. Their fuel consumption, it is understood, ranges from 2 pounds upwards per horse power per hour, while that of the St. Paul is 1.22 pounds per horse power per hour, developing 21,572.4 horse power, the engines making 90 revolutions.



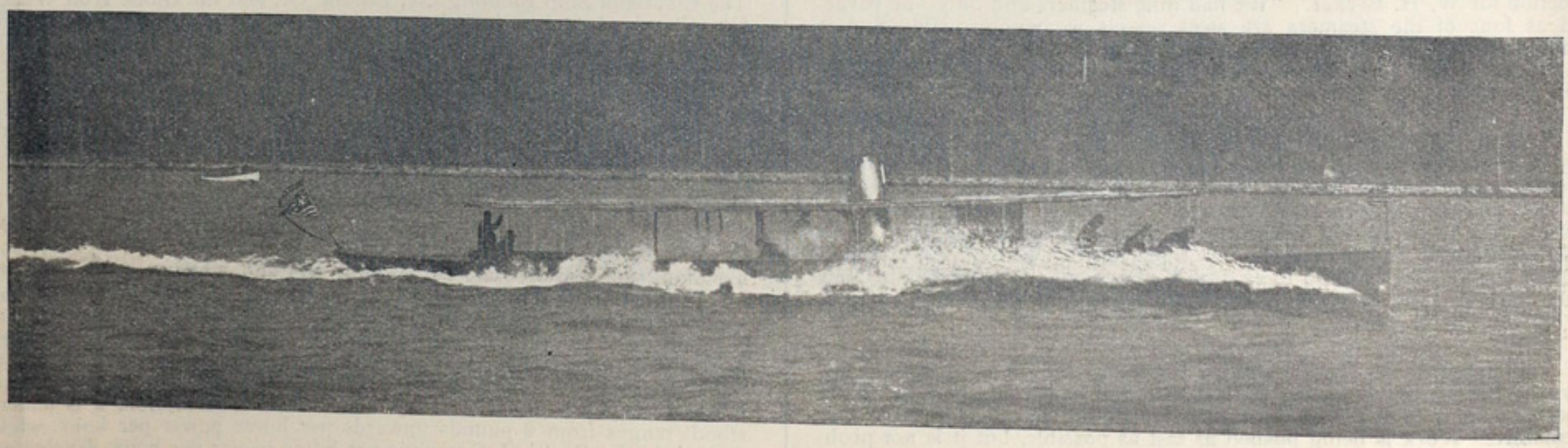
OCEAN TOW BOAT GETTYSBURG, BUILDING BY HARLAN & HOLLINGSWORTH, WILMINGTON, DEL.



KLONDIKE STEAMER BUILDING BY SIDNEY H. MC LANE, BALLARD, WASH.



MISSISSIPPI RIVER WAGON FERRY STEAMER, BUILT AT QUINCY MARINE WAYS, QUINCY, ILL.



STEAM YACHT ELLIDE, MAKING 40 MILES AN HOUR ON THE HUDSON RIVER.
Designed and built by C. D. Mosher, 1 Broadway, New York.

SOME INTERESTING CRAFT.

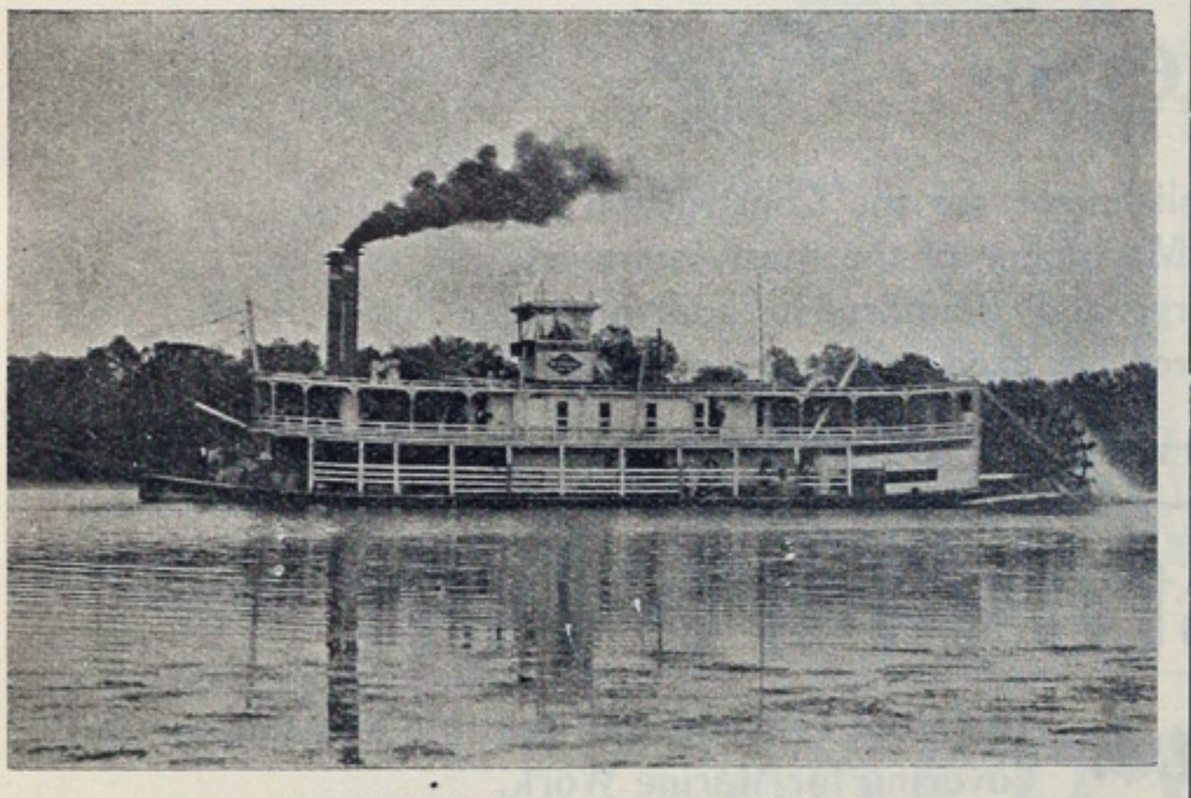
DESCRIPTIONS OF ILLUSTRATIONS SHOWN ON THE OPPOSITE PAGE AND BELOW.

The Harlan & Hollingsworth Co., Wilmington, Del., will build for the P. & R. R. R. Co., one of the largest sea-going tugs in the United States. She will be 170 feet long on deck, 29 feet moulded beam, 18 feet depth. Her engines will be the triple expansion type and will develop not less than 1,000 horse power. She will have an electric light plant, will be equipped with one 950 pound and one 500 pound anchor, and have two life boats. She will be in all respects well fitted for ocean towing service.

There is considerable curiosity as to the dimensions of steamers building for the Yukon river service, by experienced parties who know what is required. One builder in Chicago has been ordered to give out no information as to dimensions of steamers building for this service. The illustration shows a steamer building by Sidney H. McLane, Ballard Wash., for the Chicago-Yukon Commercial Co. Mild ship steel is the material used. She is 70 feet long, 17 feet 9 inches beam, and 4 feet 7½ inches moulded depth. She has capacity for sixty passengers and 40 tons of freight on the Yukon river. The motive power consists of two 7½ by 28 inch engines and a 4½ by 6½ foot Roberts boiler. Engines and boiler are furnished by the Marine Iron Works, Chicago. The approximate cost is $15,000.

A small ferry steamer of the approved style for western rivers is shown. It has capacity for ten wagons and was built by the Quincy Marine Ways, Quincy, Ill., at a cost of $6,500. Oak was used for framing and planking and white pine for decks. The Central Iron Works, Quincy, Ill., furnished the engines.

The photographic illustration shows the steam yacht Ellide making 40 miles an hour on the Hudson river. She is probably the fastest water craft in America. She was designed by Charles D. Mosher, 1 Broadway, New York.



ILLINOIS RIVER STEAMER BOREALIS REX.

The steamer Park City is shown on the ways ready for launching from the yard of Mather & Wood, Port Jefferson, N. Y. Her dimensions are 150 feet over all, 28 feet beam and 10½ feet deep. She was built for the Bridgeport and Port Jefferson Steamboat Co., and will make 17 miles an hour in all kinds of weather, her route being one of the roughest on Long Island sound. The machinery was built by the Pacific Iron Works, Bridgeport, Conn.

The paddle-wheel steamer is the Borealis Rex, plying on the Illinois river between Peoria and La Salle. This steamer makes the round trip between these places, 142 miles, consuming five tons of soft coal screenings, costing only 65 cents per ton, making a total of $3.25 or less than 2½ cents per mile for fuel. She was built and is owned by D. M. Swain, Stillwater, Minn. The secret of her low fuel consumption is that she has compound engines designed by her builder. Her speed is about 12 miles an hour.

Taylor Water Tube Boiler.

The steel tug to be built by the Craig Ship Building Co., Toledo, O., for the United States Engineer, Buffalo, N. Y., will be fitted with a Taylor water tube boiler, 150 pounds pressure. This boiler won considerable fame in the Enquirer-Say When race off Cleveland, June 1896. The Enquirer, the winning yacht, had a Taylor boiler, and furnished such an abundance of steam that the safety-valve was popping when she crossed the line.

During the summer of 1897, Chicago's new fast yacht Pathfinder challenged the Enquirer to race from Chicago to Milwaukee, 82 miles, for a $500 cup and the championship. The owner promptly accepted the challenge. The boats had a fair start and the Enquirer began at once to gain on the Pathfinder, and constantly pulled away from her for a distance of about ten miles. At that time the Pathfinder ruptured a tube in her Thornycroft boiler and was towed home. The Enquirer finished the course and holds the championship for another year. Her Taylor boiler was uninjured, and the Detroit Screw Works, manufacturers, claim that after an experience of four seasons with these boilers, there has never been a cent expended to replace or repair any pipe or fittings in any Taylor boiler ever yet built. They also claim to have the fullest endorsements of the owners of every Taylor boiler ever made save one, one of the earliest of the first season's output.

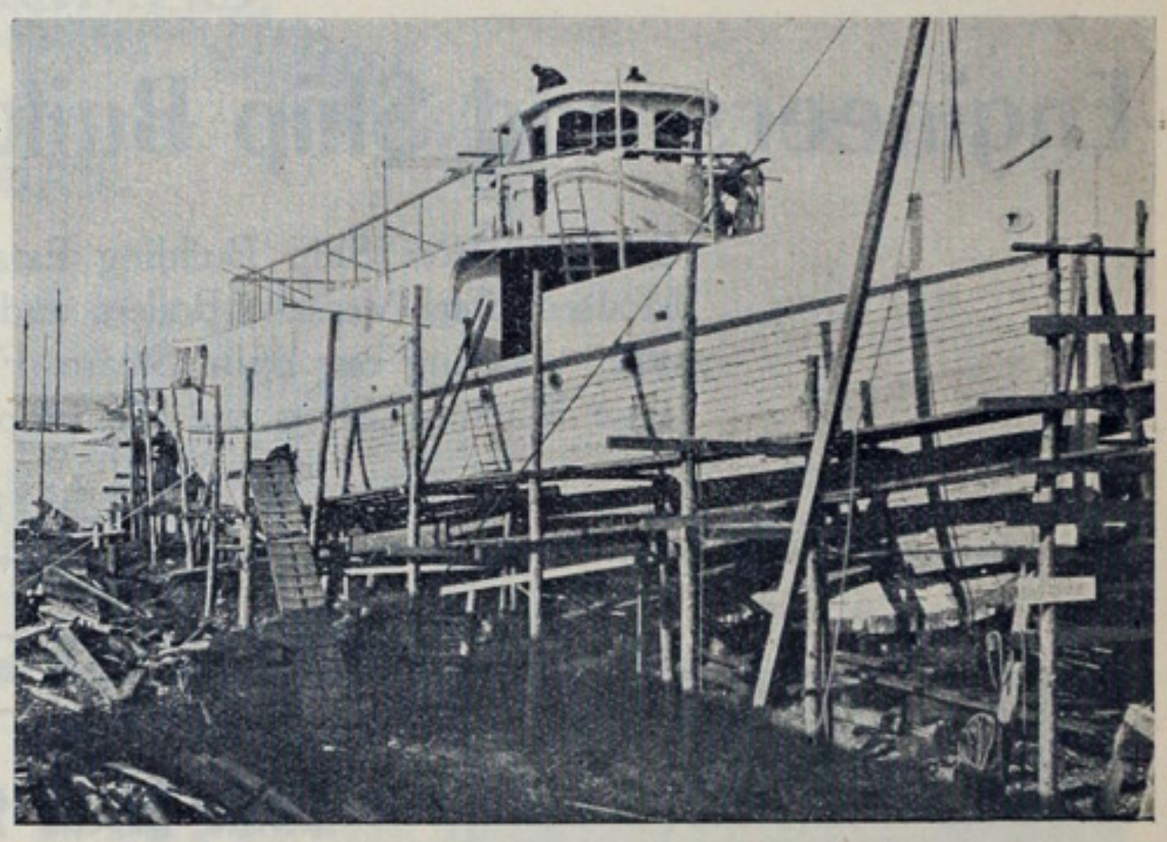
A Modern Ship-Machinery Plant.

A supplemental illustration shows the new plant of the Hyde Windlass Co., at Bath, Maine. The buildings which are entirely of steel and brick and are of fire proof construction, cover considerable over an acre of ground. In building the plant nothing has been left undone which would add to its efficiency, and all the various departments are thoroughly equipped with the most modern appliances for minimizing the cost of construction.

The foundry is 190 feet in length by 100 feet wide. The center space which is 50 feet wide is covered by a 20 ton Morgan electric crane, while steel jib cranes of 8 tons capacity are placed at intervals on the steel columns, which support the runway of the traveling crane. There are two Colliau cupolas each of a capacity of 9 tons per hour; in addition to these there is a reverberatory furnace of 10 tons capacity, and crucible furnaces of 2 tons capacity. The blast is supplied by a Root blower connected direct to a 40 horse-power Westinghouse motor. A hydaulic elevator is used to elevate the iron and fuel to the charging floor. The sand mixing machine and other labor-saving appliances, are all driven by additional electric motors.

The machine shop, 285 feet in length by 80 feet in width, is equipped with a Shaw electric traveling crane of 15 tons capacity. The machine tools are all of the latest design and made by the best builders. All materials used in the manufacture of the various Hyde patents are tested on a 150,000 pound Riehle Bros. testing machine, which is fitted with automatic beam and autograph attachment.

The pattern shop is fully equipped with wood working machines driven by electric motors. The pattern storehouse is fire proof, 130 feet long by 40 feet wide, with a basement underneath for storing mould boards, small flasks, etc. The entire plant is heated by the hot blast system, a 9-foot Buffalo blower driven direct from an electric motor being used to circulate the air. The commodious office building also contains the draughting room, in which is a fire proof vault for storing all drawings, so that there is no possibility of the records being destroyed by fire. The officers of the company are: J. S. Hyde, president; E. W. Hyde, treasurer; and J. R. Andrews, general manager.



LONG ISLAND SOUND PROPELLER.

A Valuable Book on Mechanical Draft.

"Mechanical Draft," published recently by the B. F. Sturtevant Co., Boston, Mass., contains more reliable data and information on this subject than has ever yet been collected. Some fifty or more pages are devoted to mechanical draft for marine steam plants. Results of forced draft trials in the U. S. navy are cited, and full explanations and illustrations of the Howden and Ellis & Eaves' systems are given. Tests of the lake steamer L. C. Waldo are included, and the results from the use of the Howden draft on the American liners St. Paul and St. Louis are shown. Details of voyages of the ocean freight steamer Kensington, equipped with the Ellis & Eaves' system, are very interesting. No mechanical or marine engineer or naval architect in the United States can afford to be without it. Technical books of this size and class usually cost from $5 to $10, but the publishers do not set any price on it. That its treatment of the subject has been exhaustive is evidenced by the fact that it not only represents the accumulated experience of over a quarter of a century, but its preparation has required nearly two years of most careful study and investigation by an expert in this work. Much of the information could not be obtained by anyone else. It is published in pursuance of the established policy of the Sturtevant company to always thoroughly inform the engineering public regarding the specific principles and applications of the various systems which it has presented.

WANTED.—To charter four or five package freight boats; one to three years; boats adapted for both ore and package freight preferred. In making application state as to gangways and hoisting machinery in detail; also estimated capacity in full load, barrels of flour or mill stuffs, grain and ore; what kind of machinery and boilers and coal consumption of twenty-four hours' steaming; also speed per hour, and where boat laying at present. Address Marine Review, Cleveland, O.

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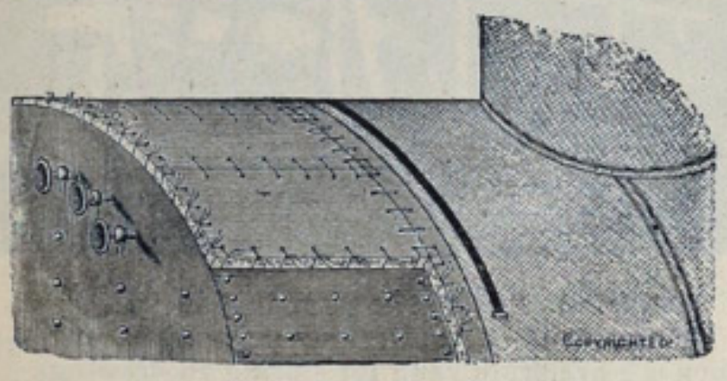

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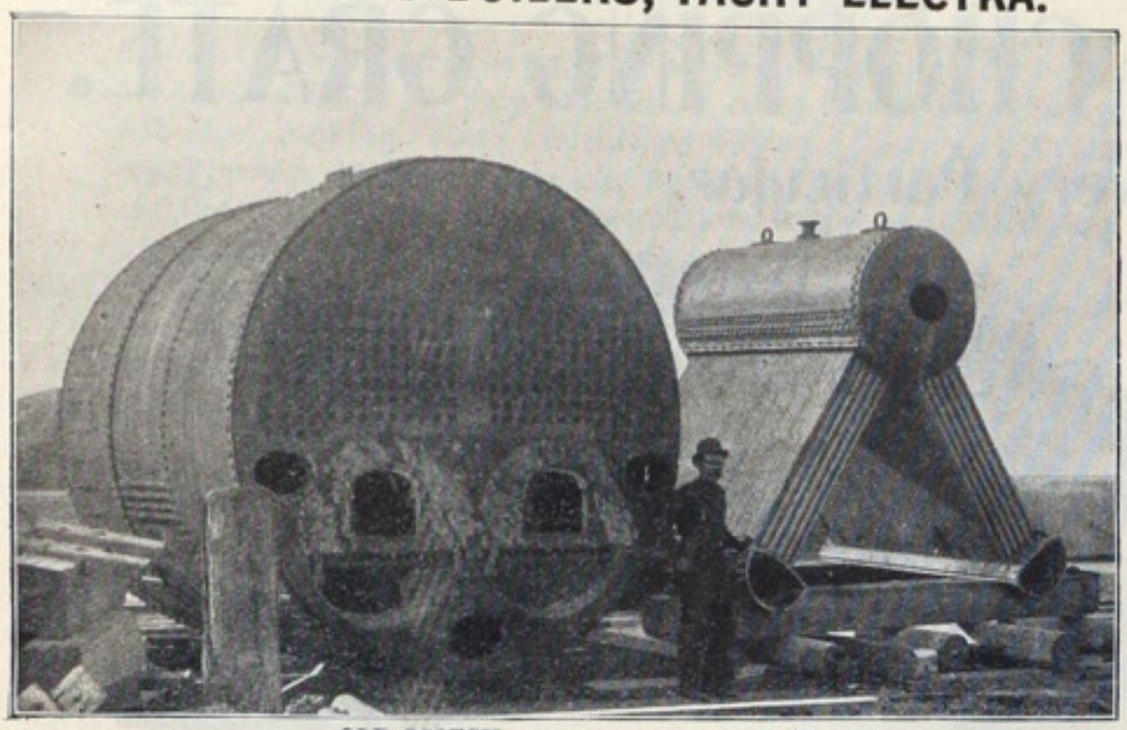

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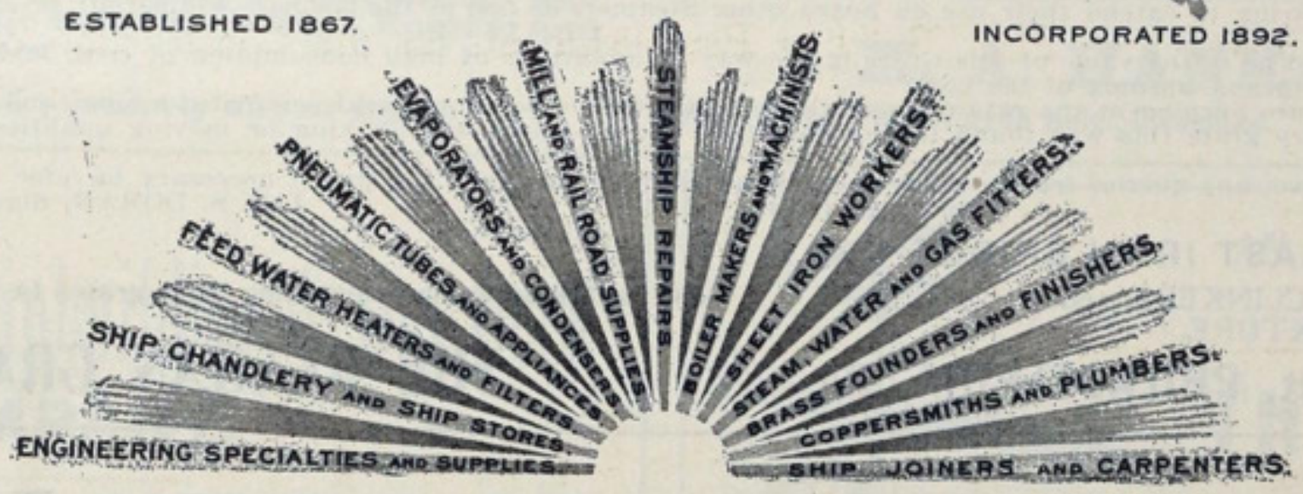

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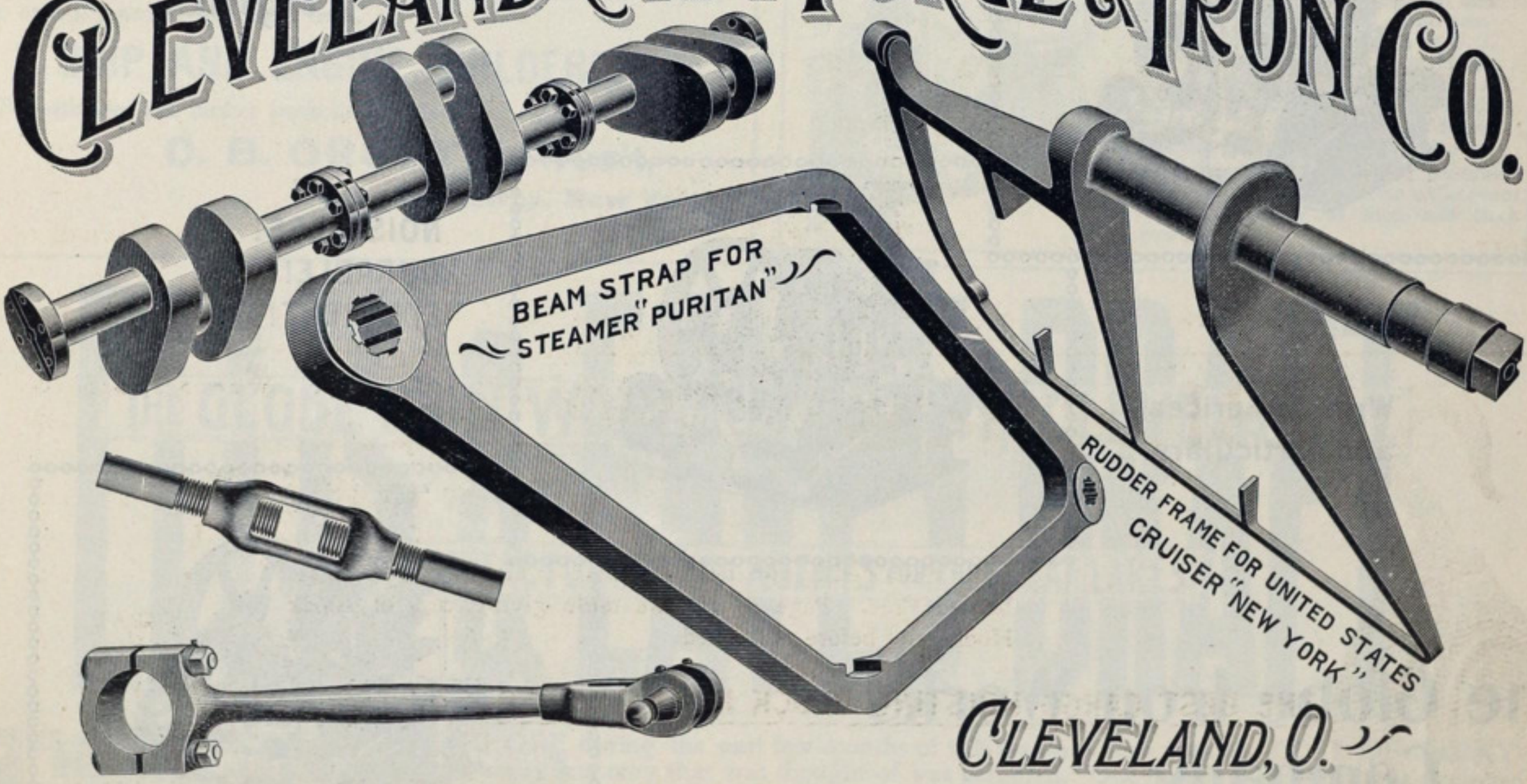

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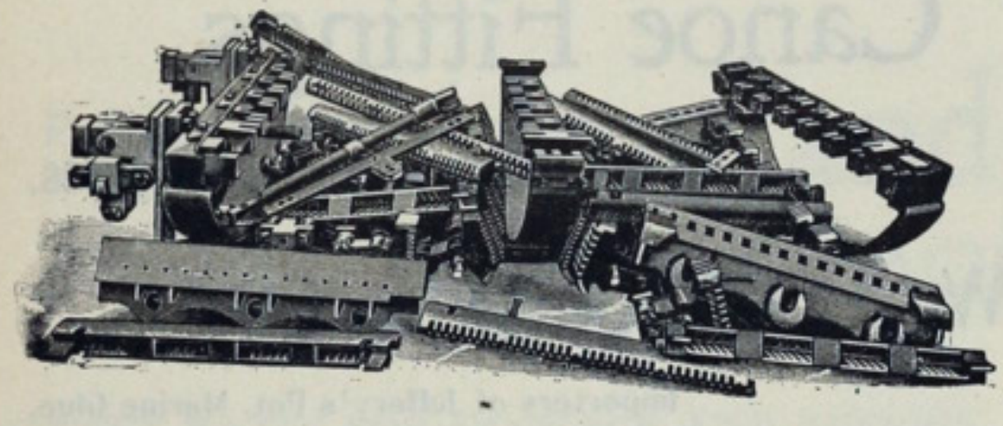

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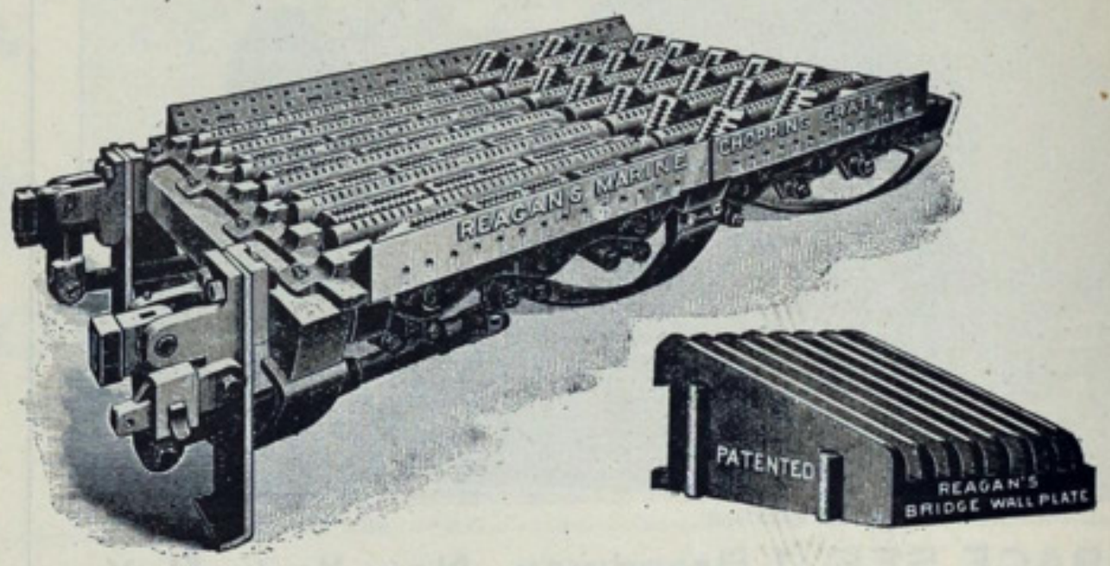

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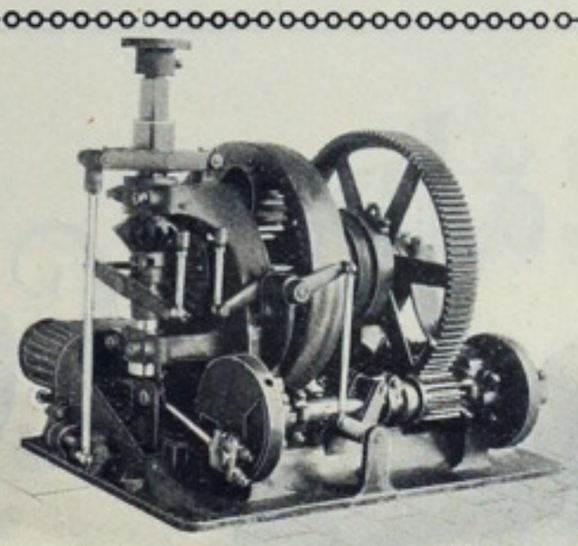

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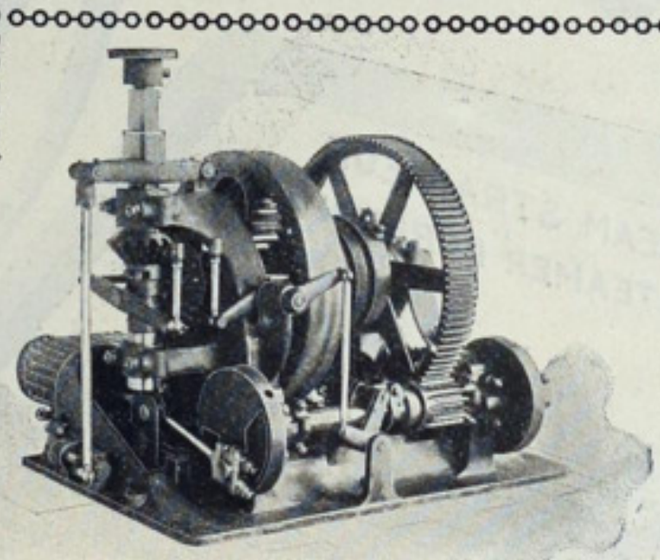

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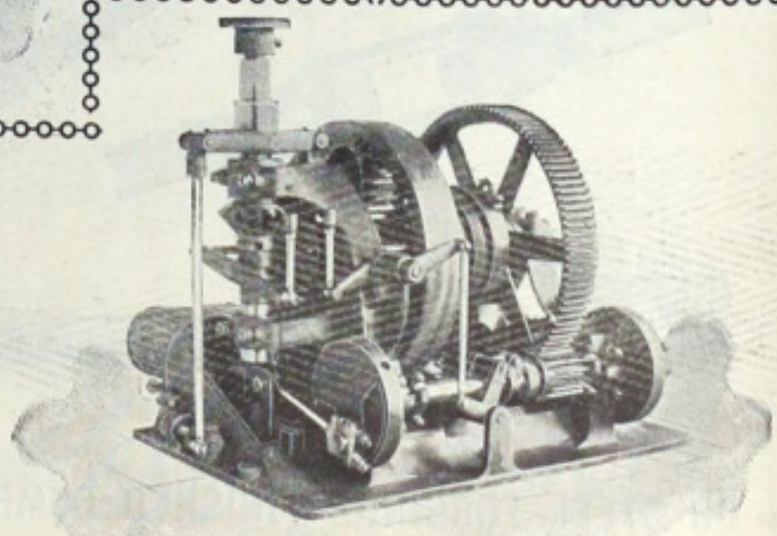

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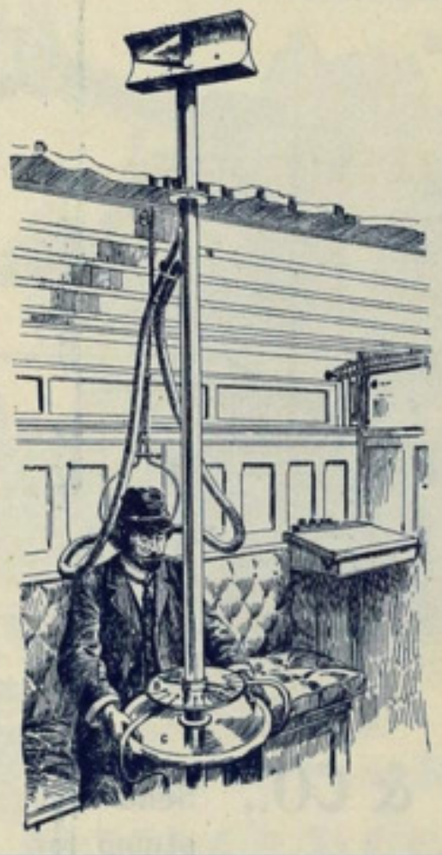

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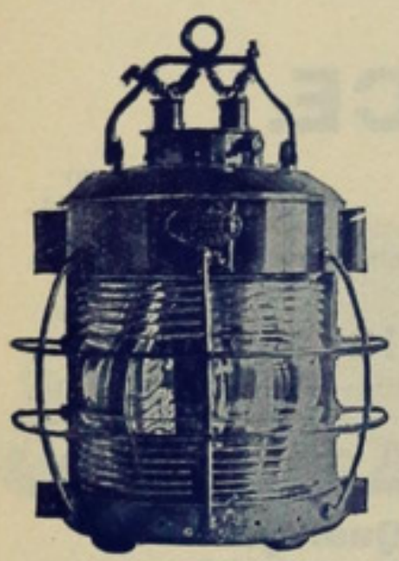

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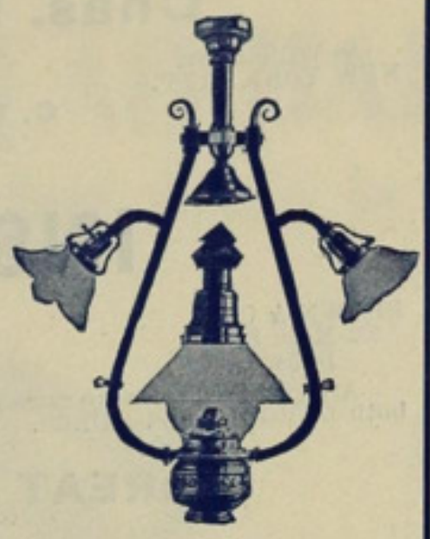

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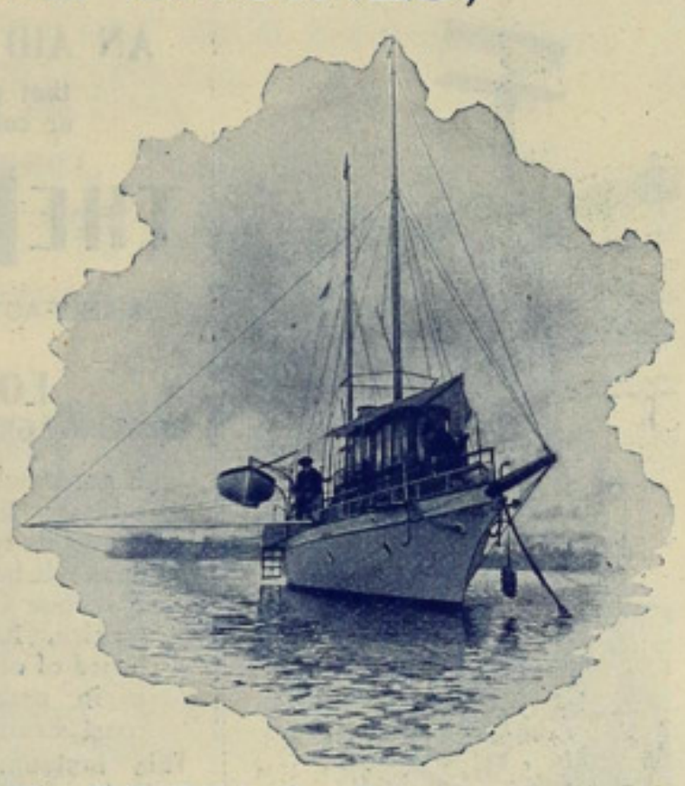

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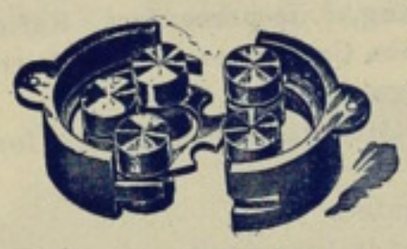

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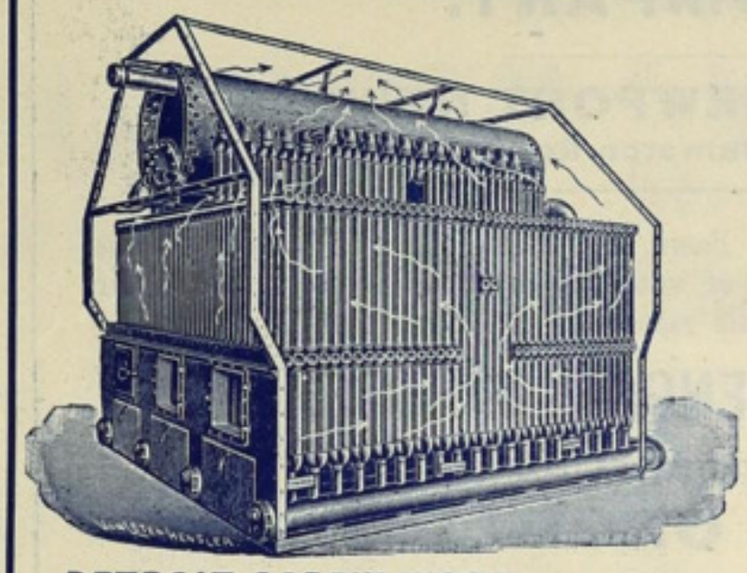

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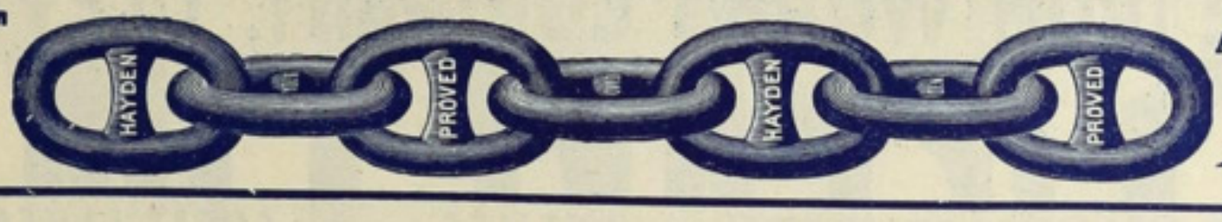

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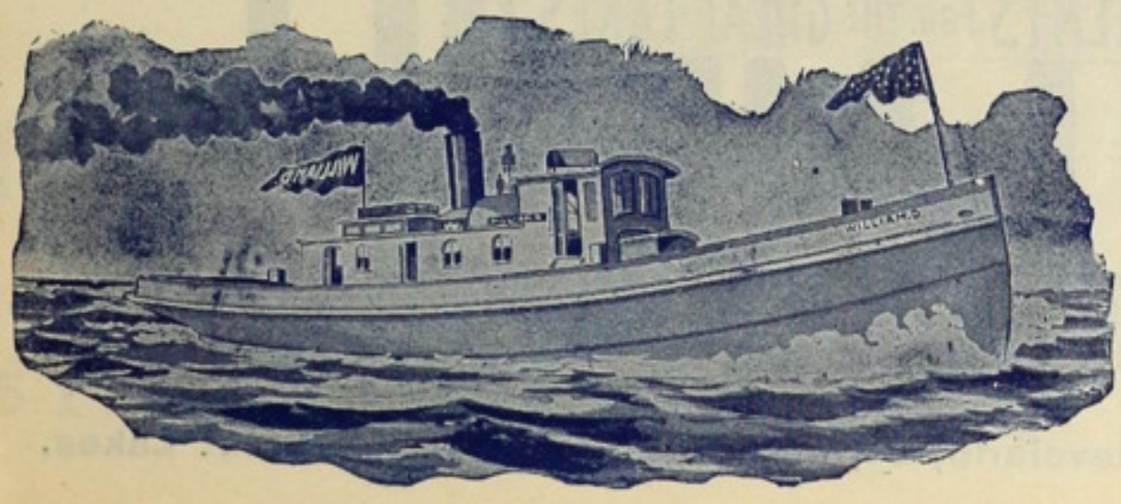

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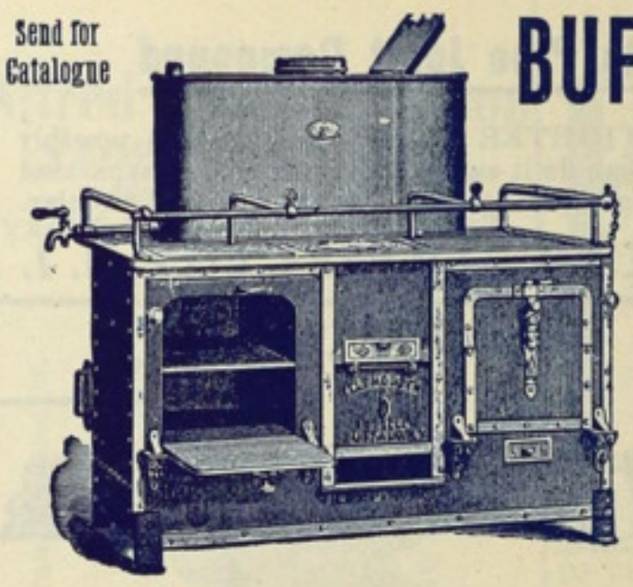

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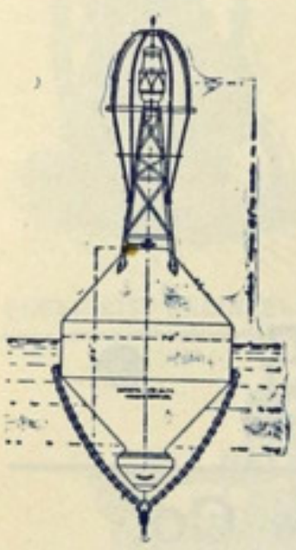

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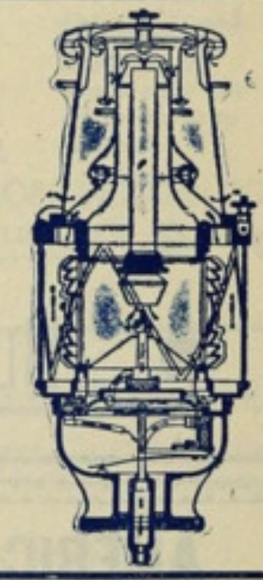

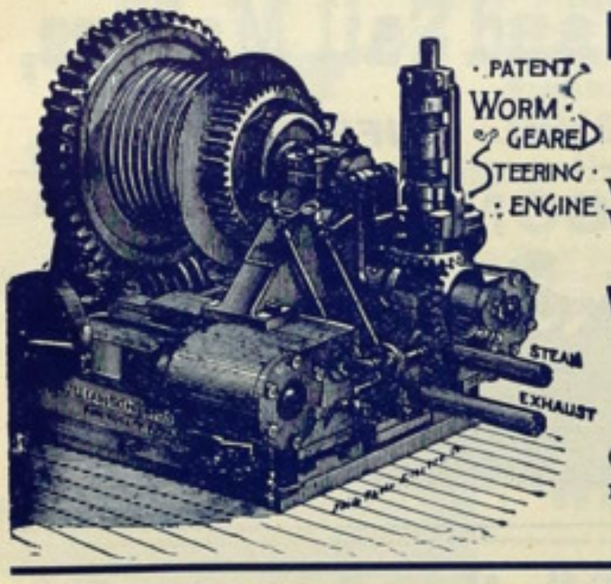

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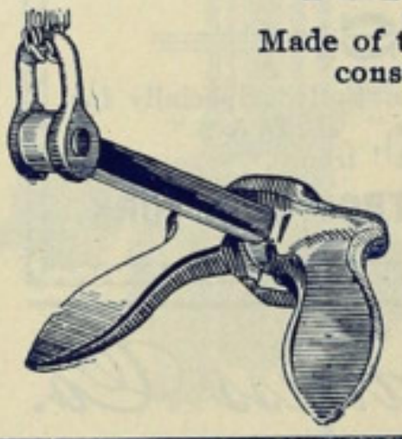

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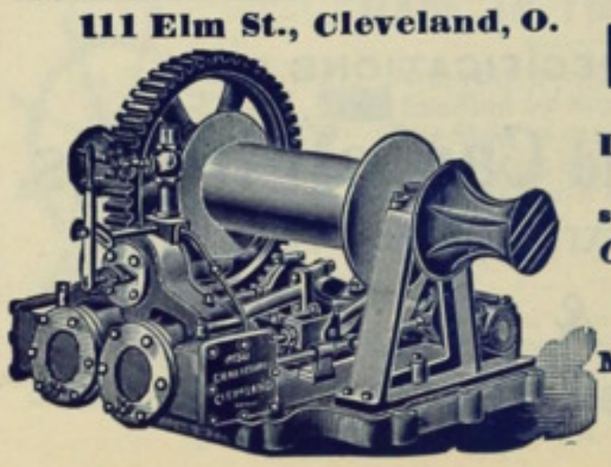

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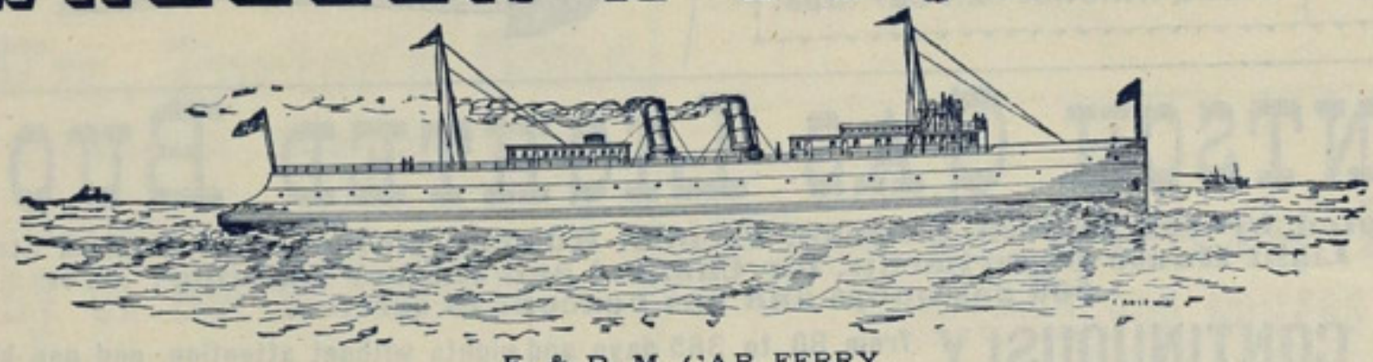

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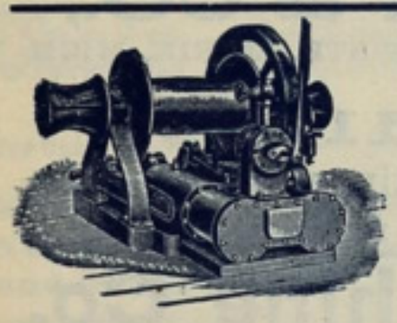

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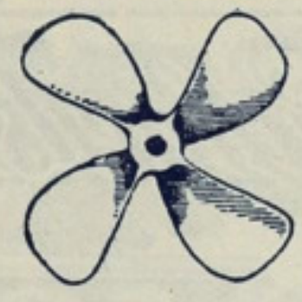

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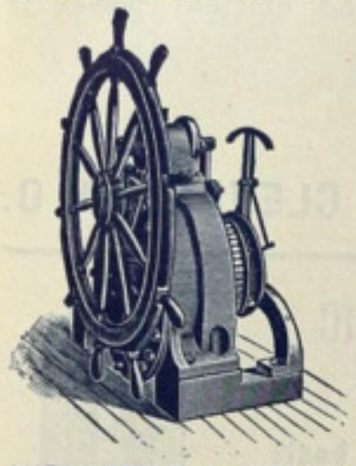

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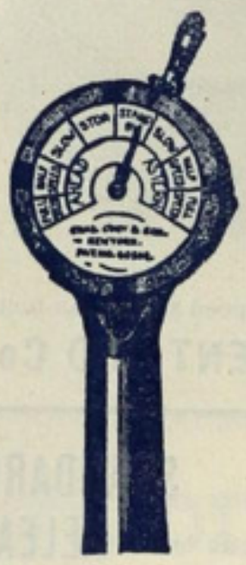

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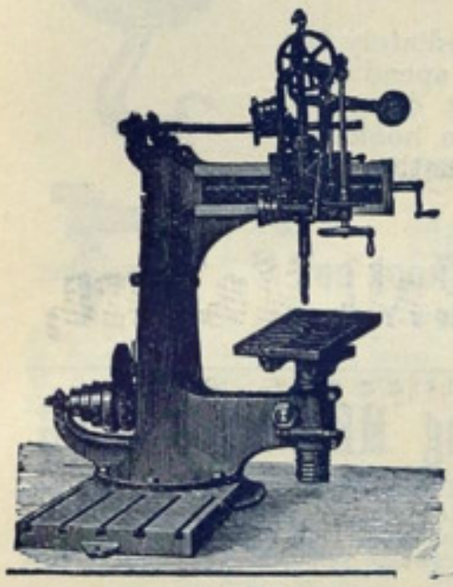

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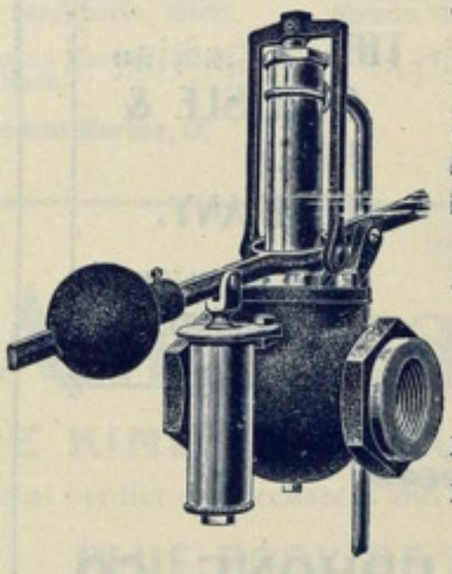

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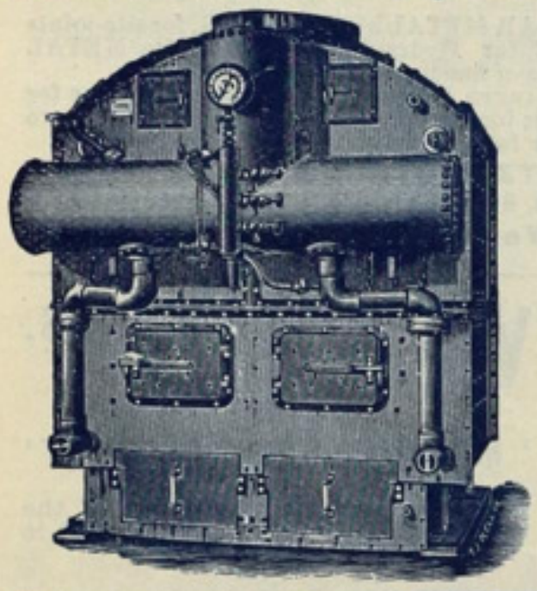

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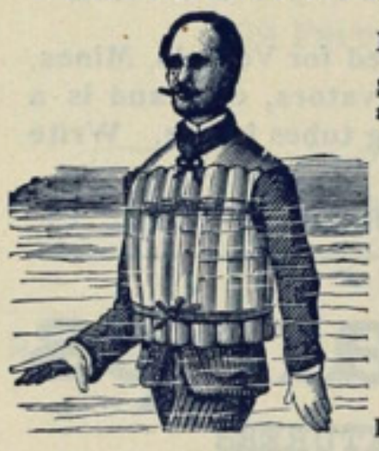

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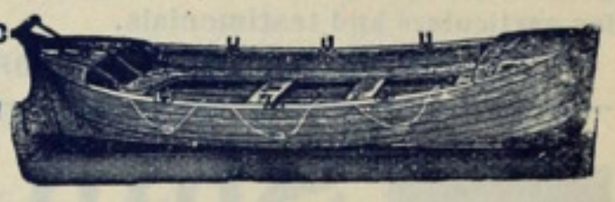

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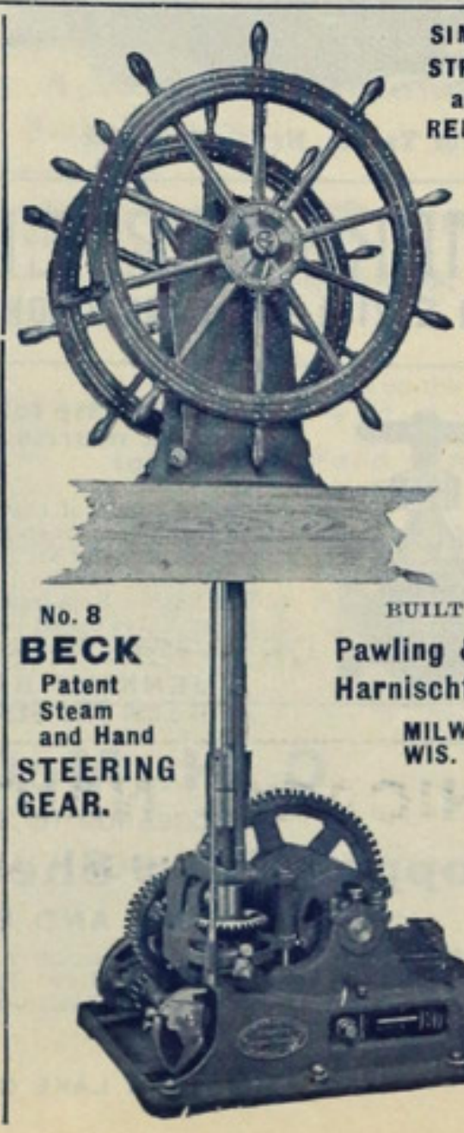

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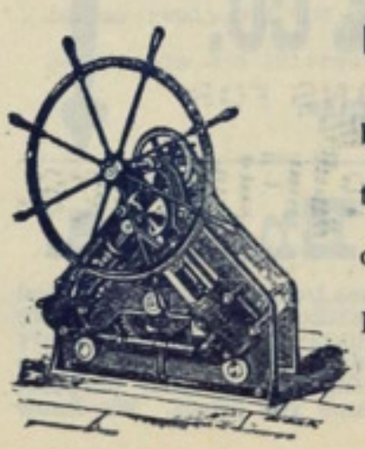

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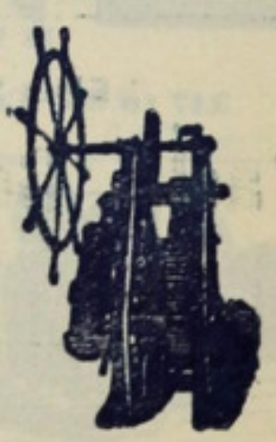

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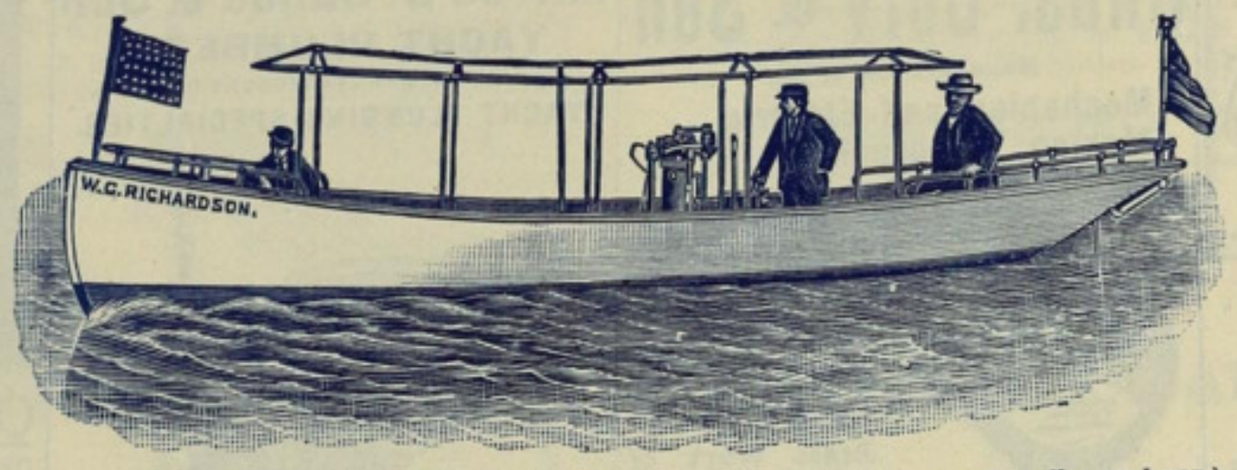

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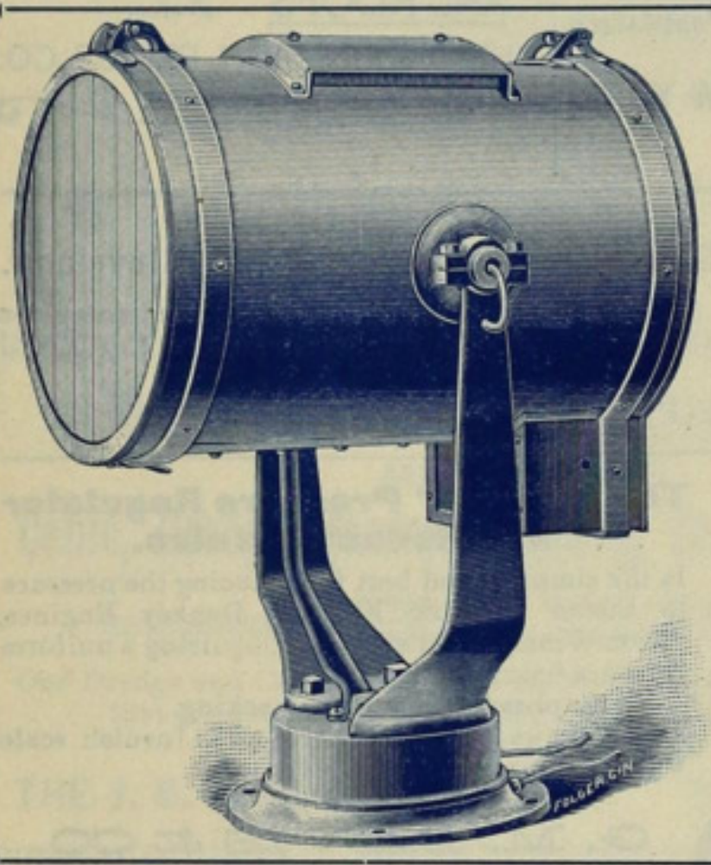

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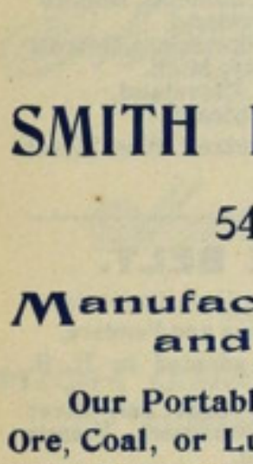

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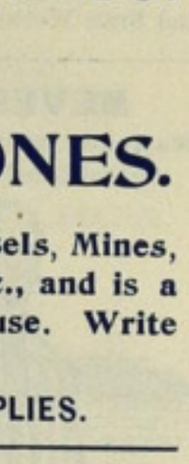

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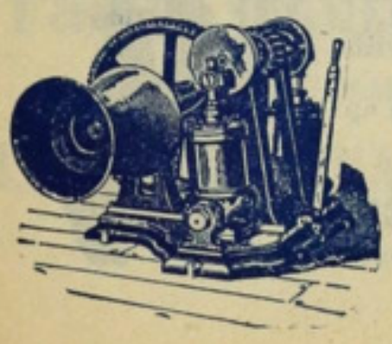

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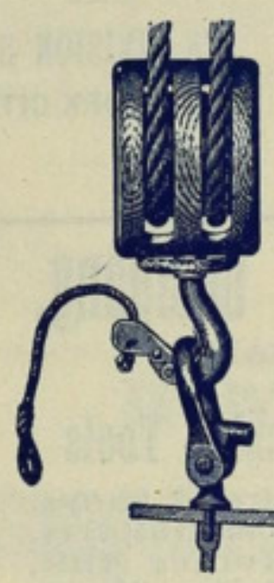

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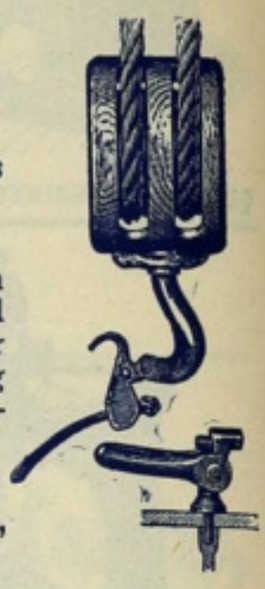

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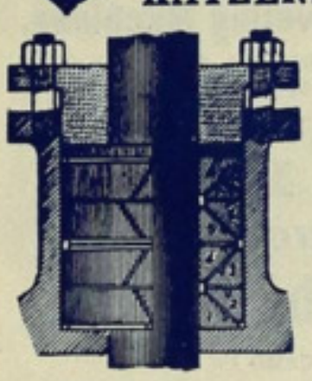

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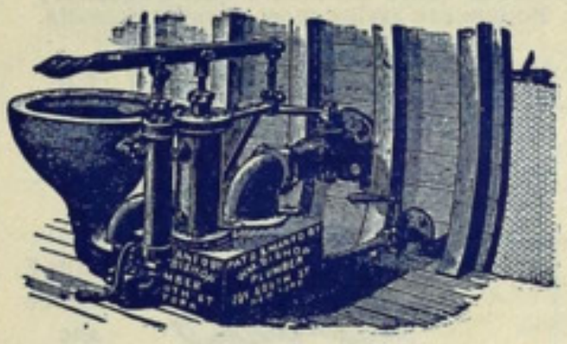

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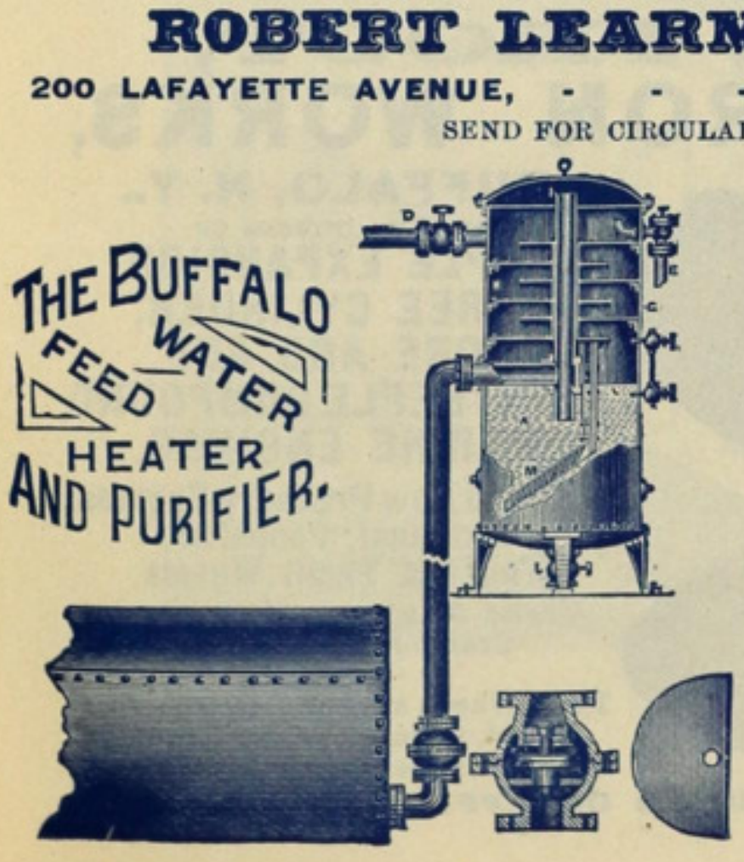

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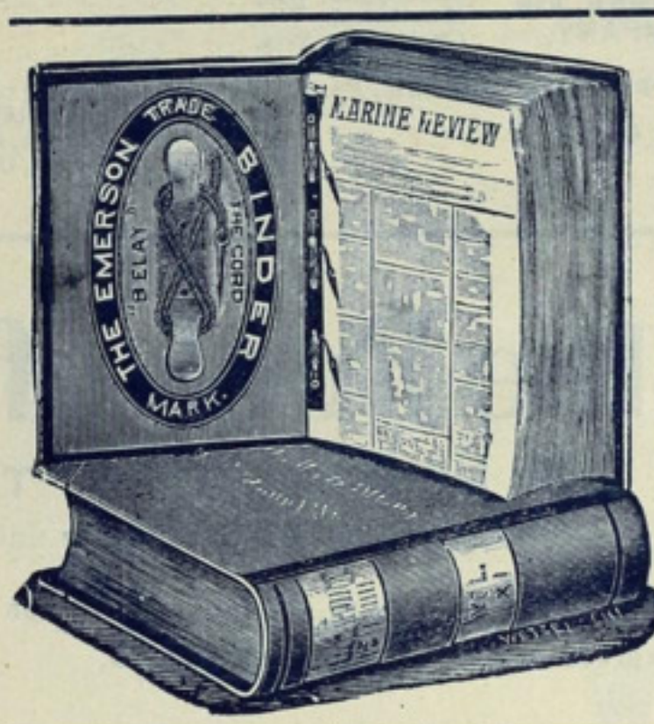

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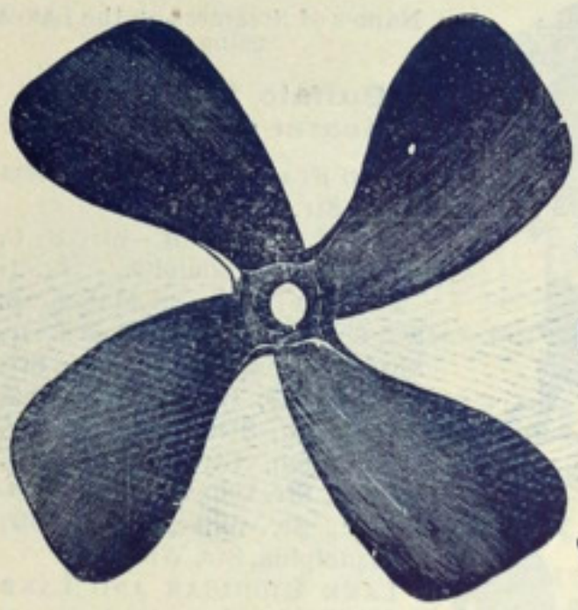

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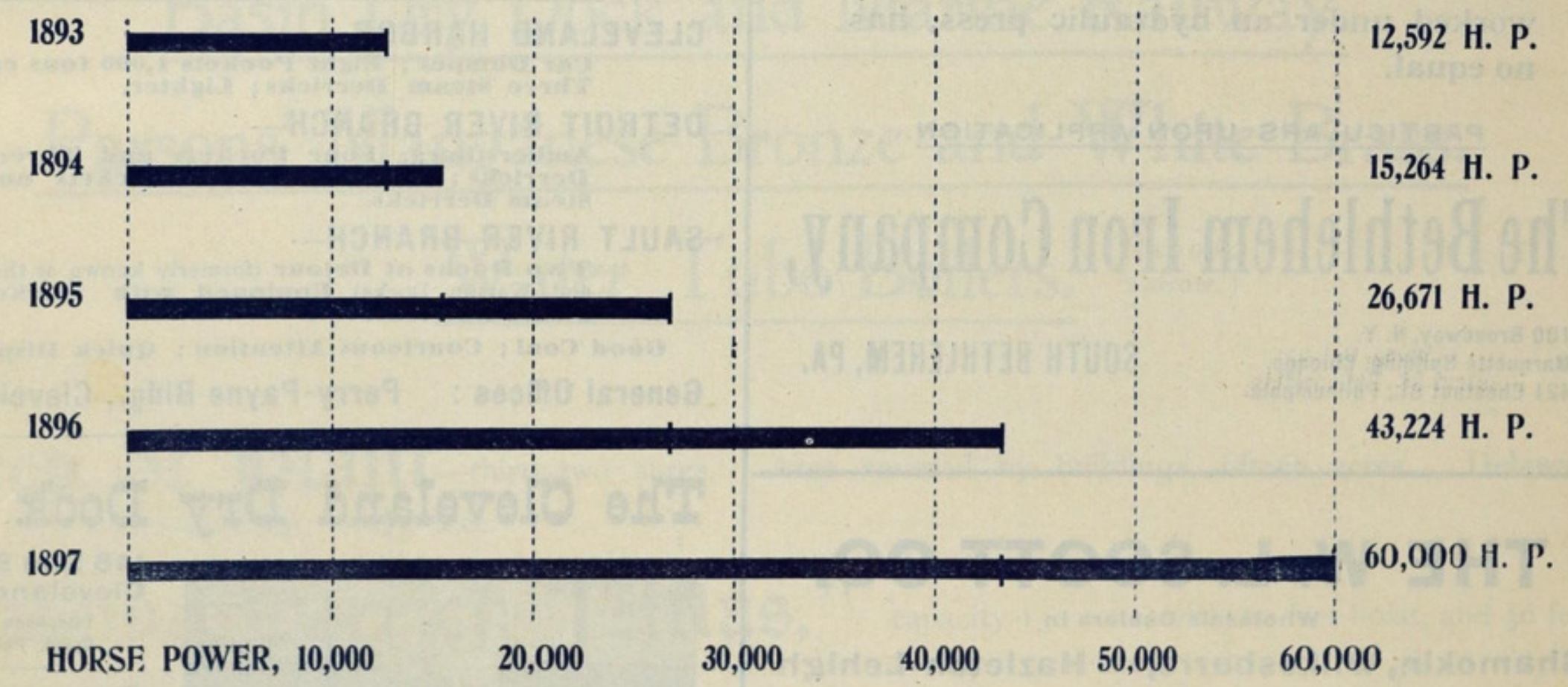

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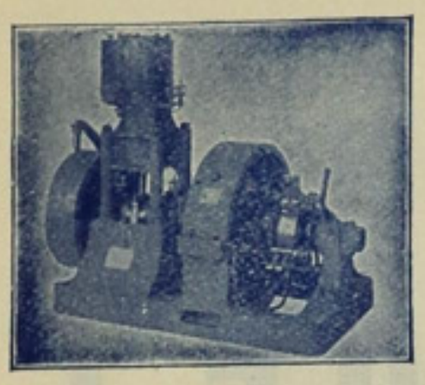

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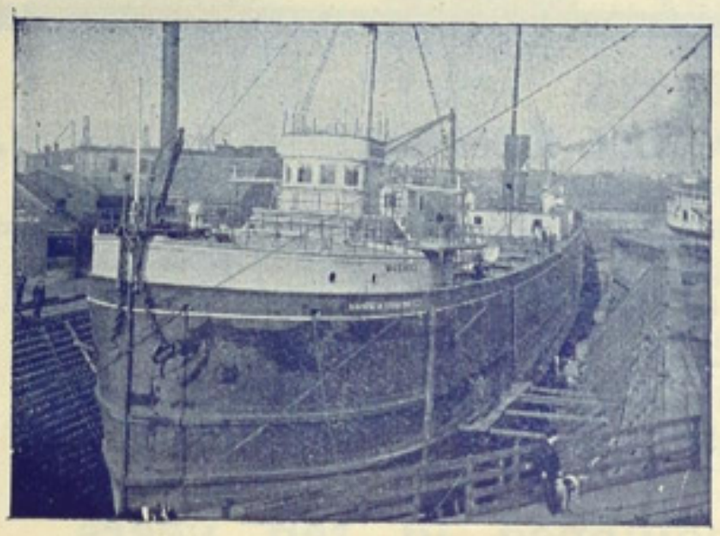

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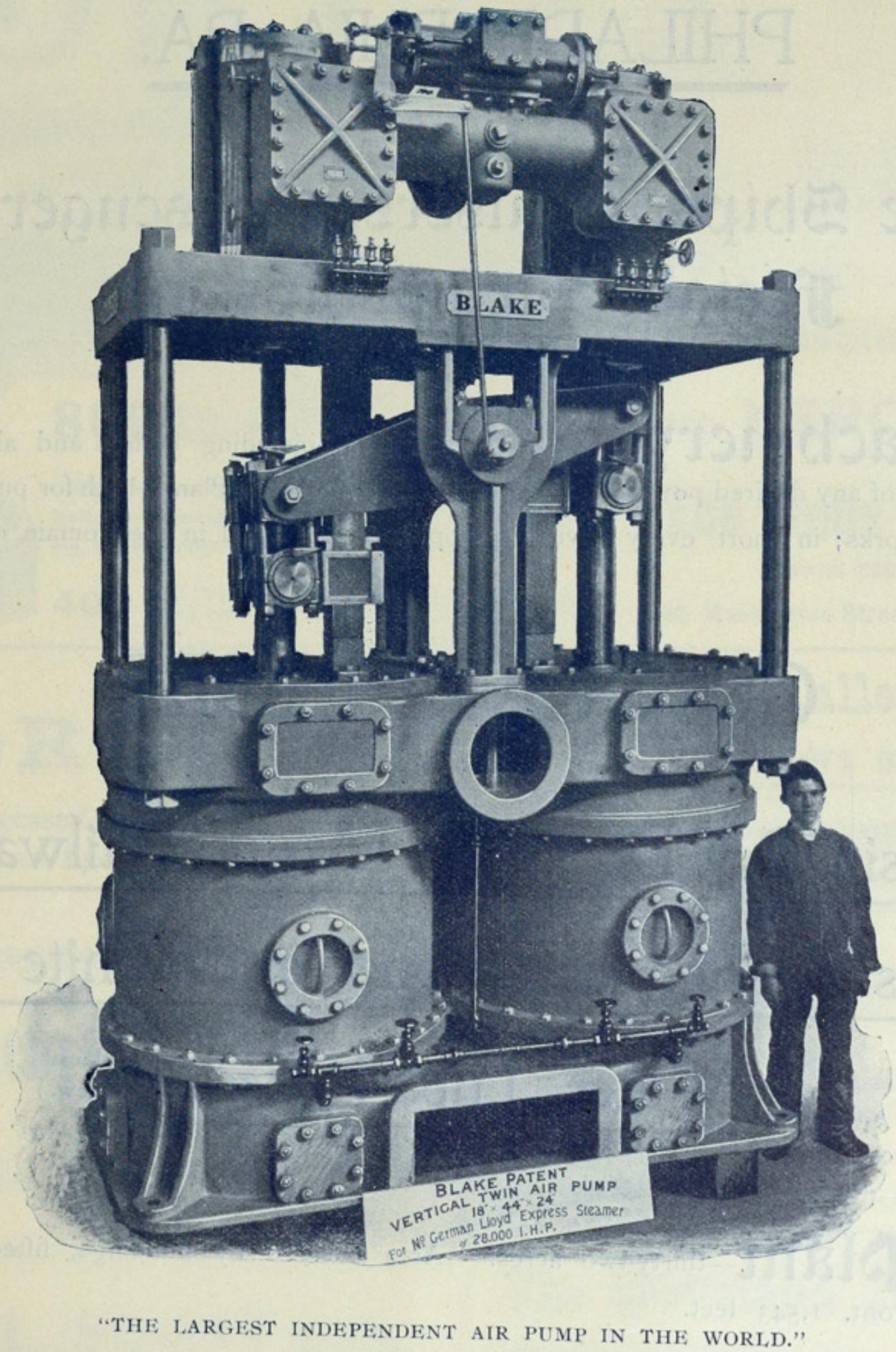

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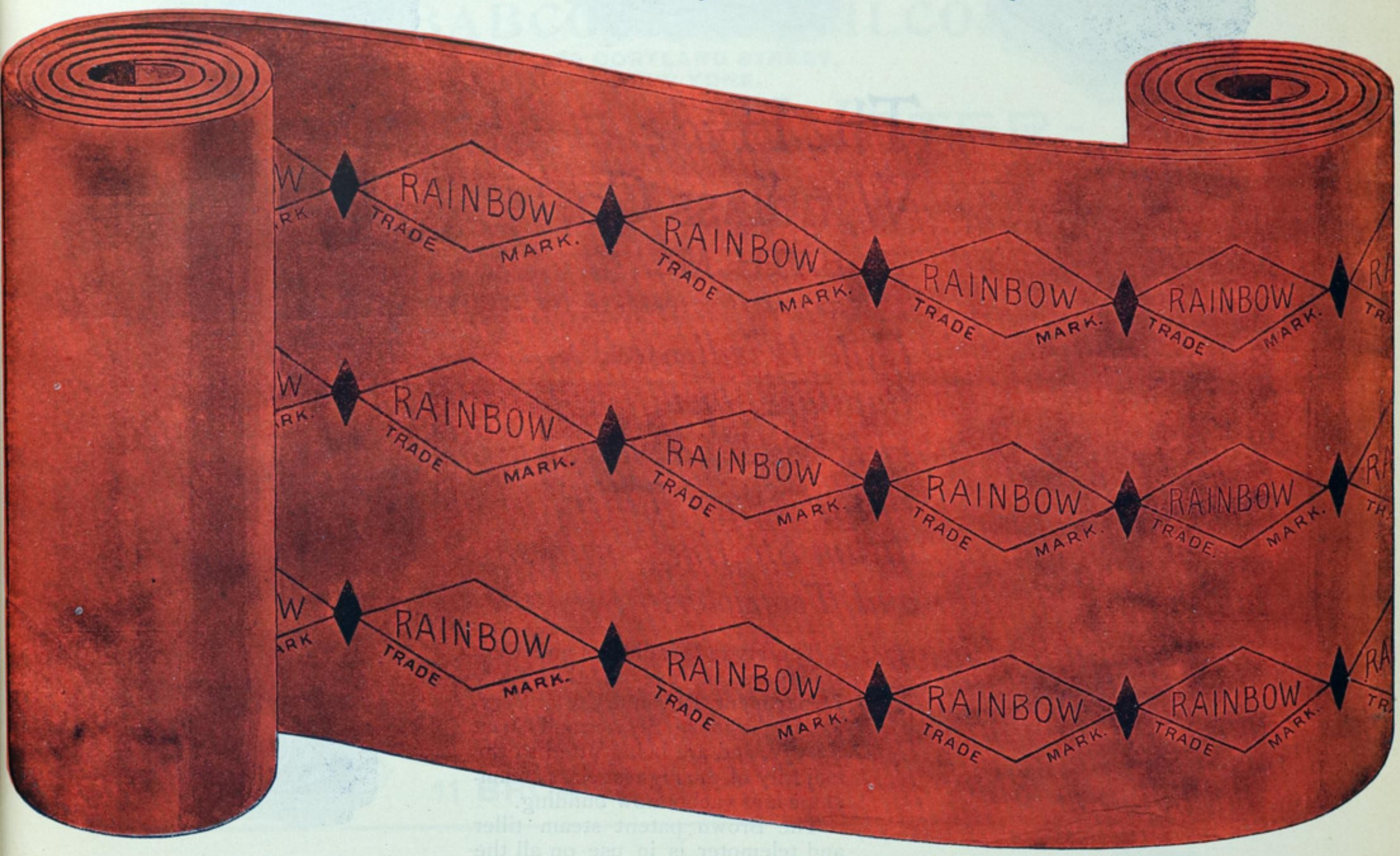

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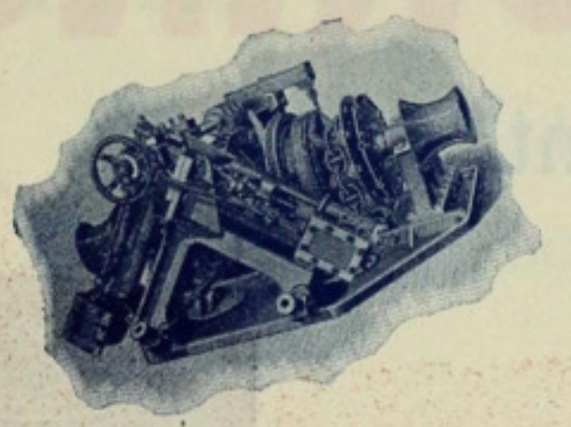

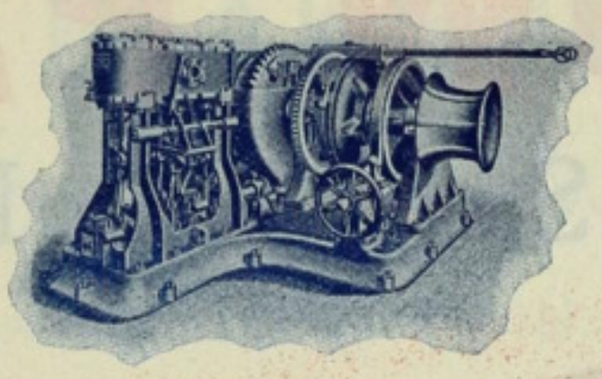

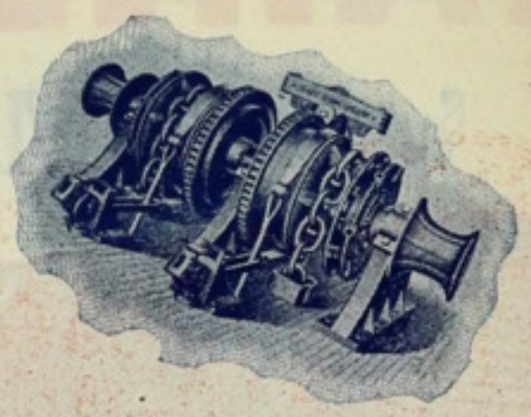

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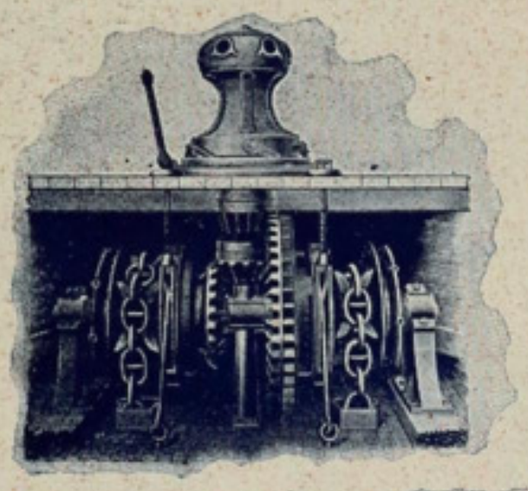

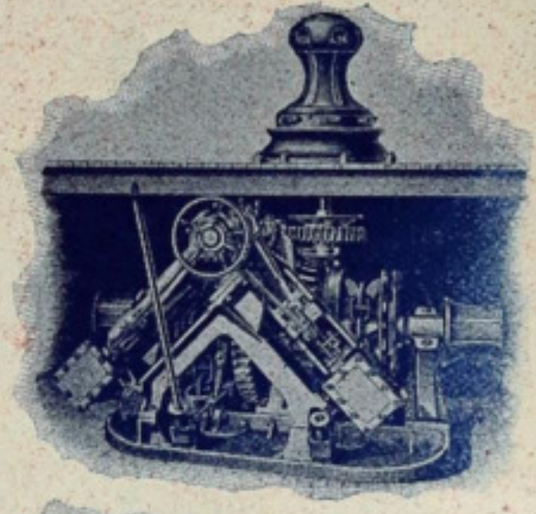

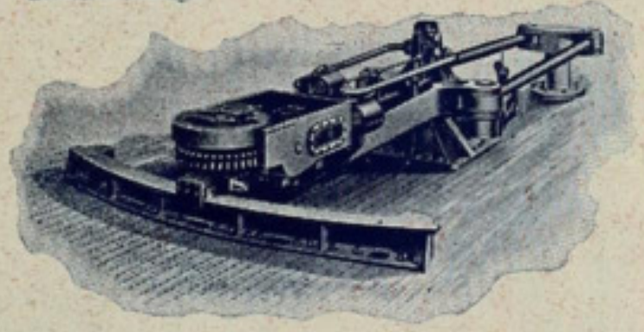

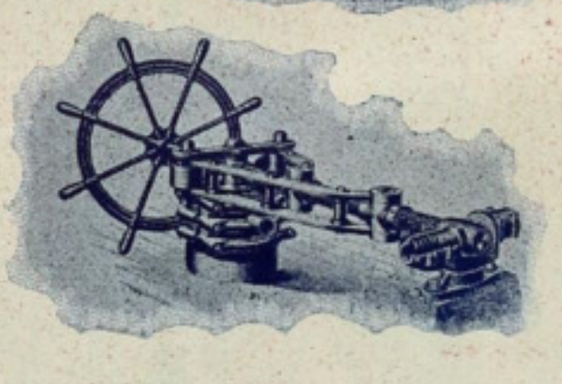

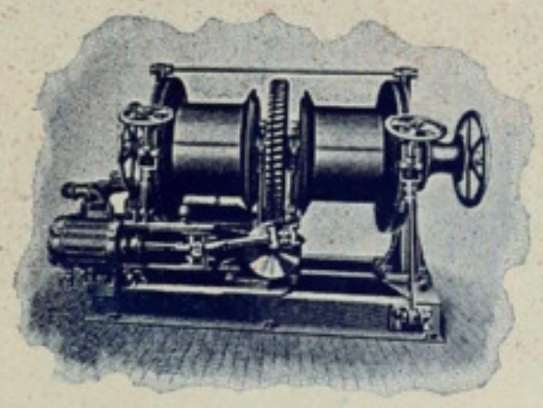

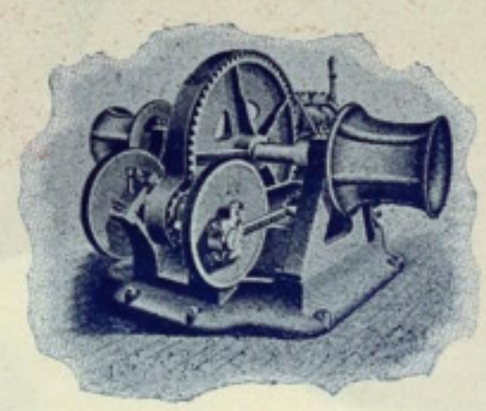

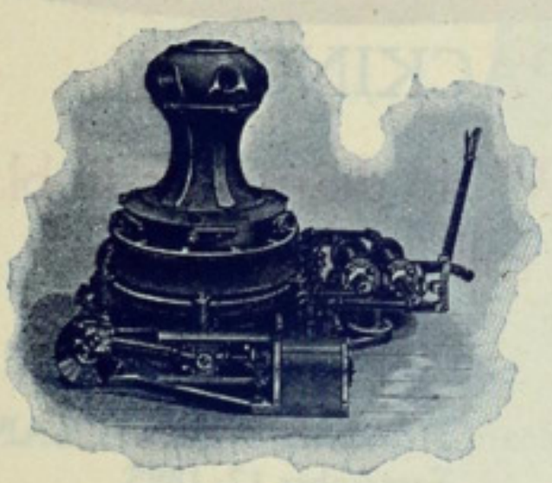

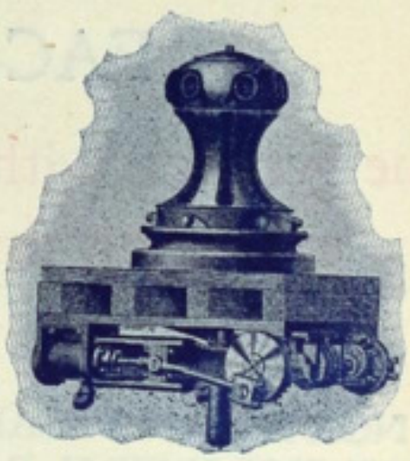

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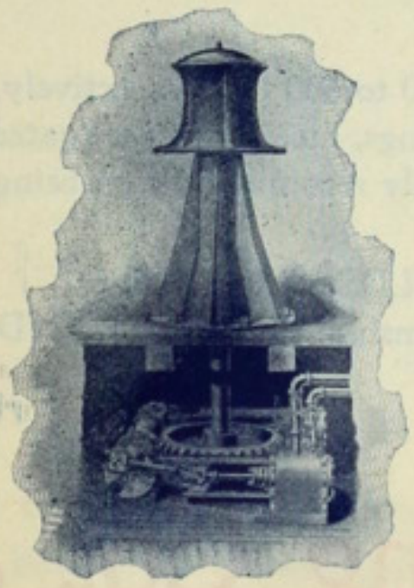

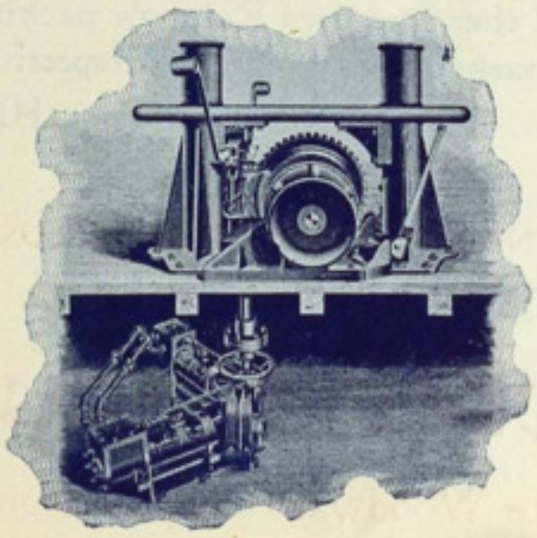

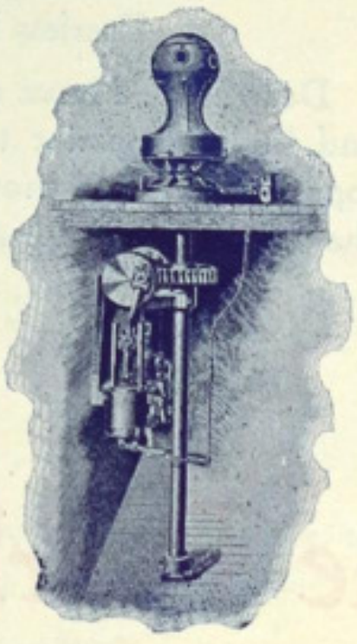

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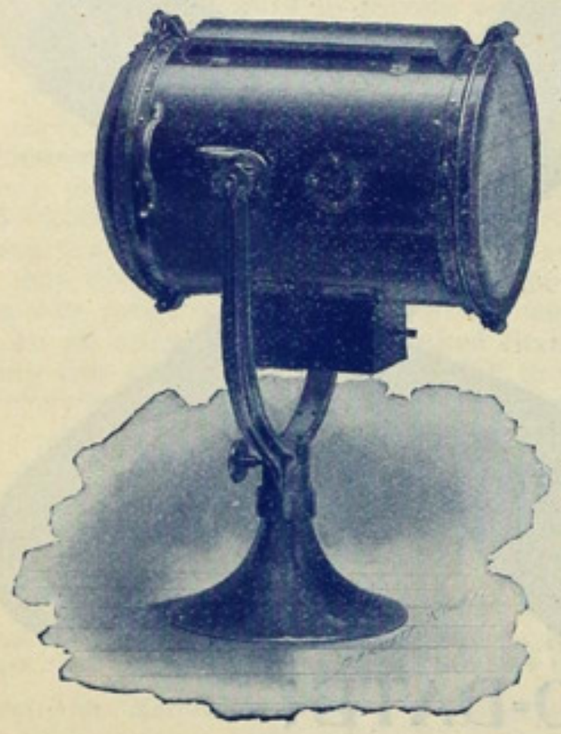

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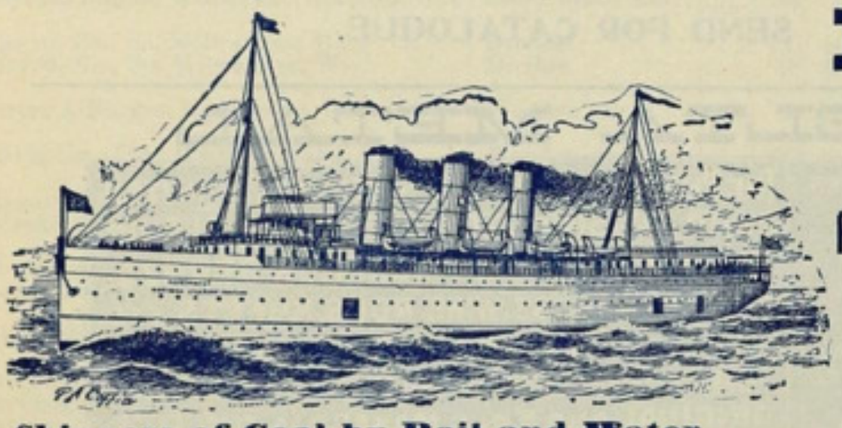

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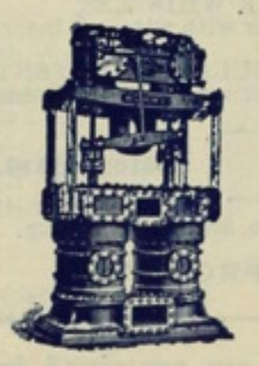

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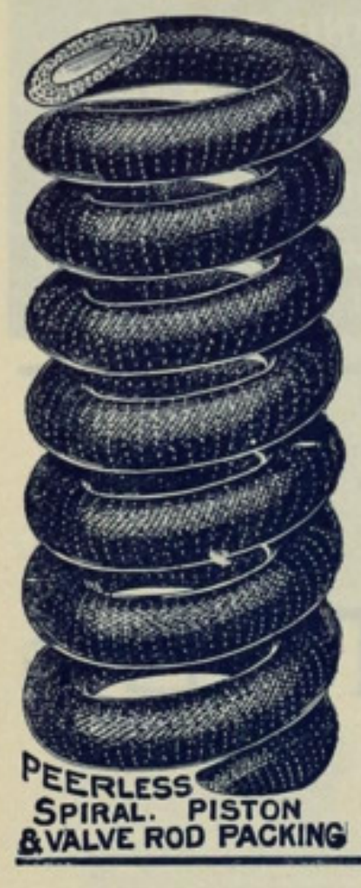

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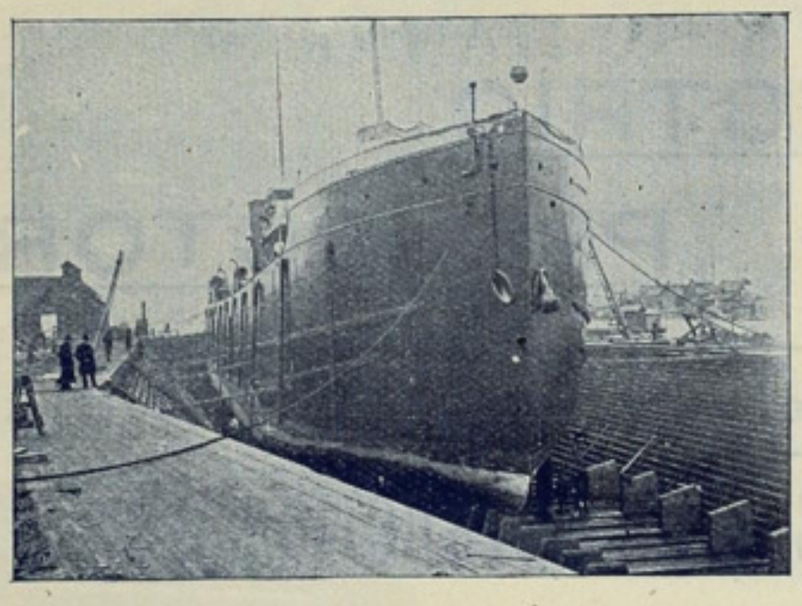

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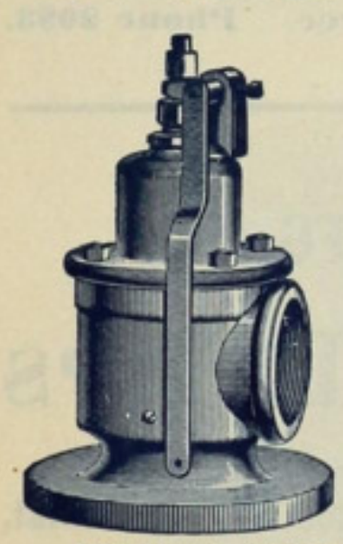

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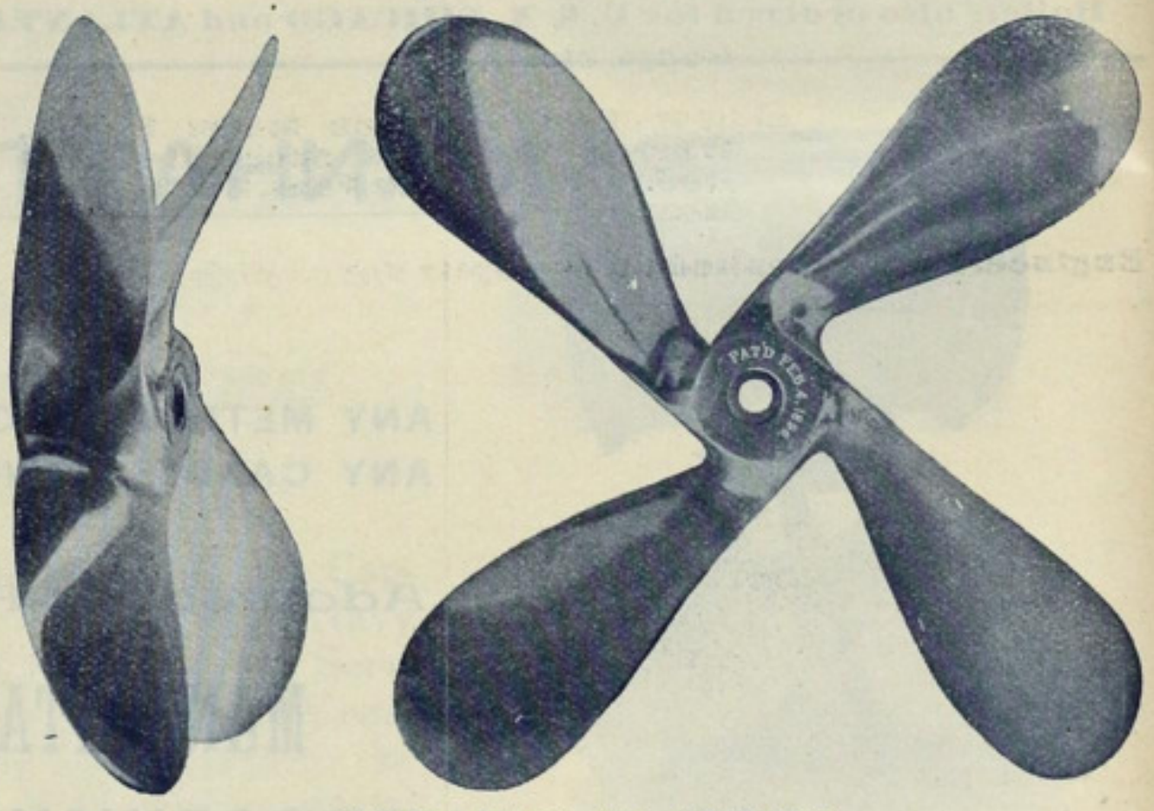

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